TECHNOLOGY DEPT.

February 5, 1941

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DETROIT

NATIONAL PETROLEUM NEWS

CLOSE FRACTIONATION OBTAINED WITH STEDMAN PACKED TOWERS

Comparison of performance of several different types of tower packing show unusual operating characteristics for shaped-wire-cloth type packing in laboratory columns. Page R-34

• • •

GET CETANE NUMBERS QUICKLY WITH NEW "CETANE VALVE"

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• • •

IMPROVE PHARMACOPOEIA TESTS FOR PETROLEUM PRODUCTS

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D. J. indicts 3 pump companies on monopoly charges. Page 11.

* * *

'Alky-Gas' proponent scored by A.P.I. Motor Fuels secretary. Page 21.

* * *

New classification for greases to be effective March 1. Page 21.

* * *

Schicktanz heads agricultural motor fuel research bureau. Page 21.

* * *

New refinery to be constructed at Indianapolis. Page 23.

Practically all southwest crude purchasers buying on 100% tank table basis at 60°. Page 20.

* * *

Arkansas to get first recycling plant: Texas now has 34. Page 20.

* * *

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* * *

Billions for defense create new oil markets. Page 25.

* * *

Defense-labor problems trouble Ohio oil men. Page 11.

REFINING TECHNOLOGY EDITION

PROTECTION
At Low Cost

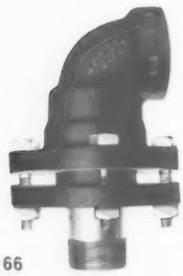

Fig. 166

Fig. 265

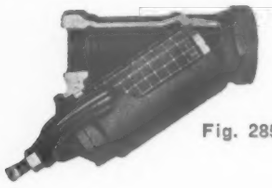

Fig. 285

Fig. 286

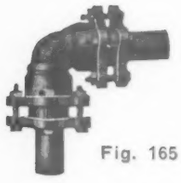

Fig. 165

Fig. 168

Morrison Line Strainers Are Built For Important Protection

A valuable pump is wrecked. A fine costly meter is utterly ruined. It happened because foreign substance was pumped through the lines into the highly important mechanisms.

Losses are increasing steadily due to leaky, inefficient swing joints.

These Morrison line strainers and swing joints, inexpensive though they are, will prevent many breakdowns and loss of time and products.

Please write for full information.

MORRISON BROS. COMPANY
OIL EQUIPMENT HEADQUARTERS
DUBUQUE, IOWA

COMING MEETINGS

FEBRUARY

Wisconsin Petroleum Assn., Annual Convention, Schroeder Hotel, Milwaukee, Wis., Tues.-Thurs., Feb. 11-13.

Kentucky Petroleum Marketers Assn., 15th Annual Meeting and Convention, Brown Hotel, Louisville, Ky., Tues.-Wed., Feb. 18-19.

American Institute of Mining & Metallurgical Engineers, Engineering Societies building and Commodore Hotel, New York, Mon.-Thurs., Feb. 17-20.

Illinois Petroleum Marketers Assn., Annual Convention and Exhibit Show, Hotel Faust, Rockford, Ill., Tues.-Thurs., Feb. 18-20.

Highway Officials of No. Atlantic States Assn., Hotel Statler, Boston, Mass., Wed.-Fri., Feb. 19-21.

North Texas Oil & Gas Assn., Wichita Falls, Tex., Sat., Feb. 22.

Liquefied Petroleum Gas Assn., Inc., Annual Convention, Chicago, Ill., Mon.-Tues., Feb. 24-25.

Iowa Independent Oil Jobbers Assn., Des Moines, Ia., Wed.-Fri., Feb. 26-28.

American Petroleum Institute, Division of Production, Southwestern District, Washington-Youree Hotel, Shreveport, La., Thurs.-Fri., Feb. 27-28.

MARCH

Ohio Petroleum Marketers Assn., Deshler-Wallick Hotel, Columbus, Ohio, Tues.-Thurs., March 4-6.

American Society for Testing Materials, Hotel Mayflower, Washington, D. C., Mon.-Fri., March 3-7.

National Dixie Distributors, Inc., Fort Worth, Tex., Mon., March 10.

American Petroleum Institute, Division of Production Spring Meeting, Pacific Coast District, Biltmore Hotel, Los Angeles, Calif., Tues., March 11.

Indiana Independent Petroleum Assn., 1941 Spring Convention & Refiners' & Suppliers' Exhibit, Hotel Severin, Indianapolis, Ind., Tues.-Thurs., March 11-13.

New Jersey Oil Trade Assn., Annual Spring Frolic & Induction of Officers, Robert Treat Hotel, Newark, N. J., Thurs., March 13.

Oil Burner Institute, Progress Exhibition, Commercial Museum, Philadelphia, Pa., Mon.-Sat., March 17-22.

American Petroleum Institute, Mid-Continent District Production Division, Herring Hotel, Amarillo, Tex., Fri.-Sat., March 21-22.

Oil Trades Assn. of New York, Annual Meeting, Waldorf-Astoria, New York, Tues., March 25.

APRIL

American Assn. of Petroleum Geologists, 26th Annual Meeting, Rice Hotel, Houston, Tex., Wed.-Fri., April 2, 3 and 4.

American Chemical Society, St. Louis, Mo., Mon.-Fri., April 7-11.

Midwest Power Conference, Palmer House, Chicago, Ill., Wed.-Thurs., Apr. 9-10.

Western Petroleum Refiners Assn., Arlington Hotel, Hot Springs, Ark., Wed.-Thurs., April 16-18.

American Petroleum Institute, Division of Production, Wm. Penn Hotel, Pittsburgh, Pa., Thurs.-Fri., April 17-18.

Fuel Oil Distributors Assn., Asbury Park, N. J., Wed.-Fri., April 23-25.

Petroleum Industry Electrical Assn., Tulsa, Okla., Wed.-Fri., April 23-25.

Natural Gasoline Assn. of America, Annual Convention, Baker Hotel, Dallas, Texas, Wed.-Fri., April 23-25.

National Petroleum Assn., semi-annual Meeting, Hotel Cleveland, Cleveland, O., Thurs.-Fri., April 24-25.

Petroleum and Natural Gas Conference, State College, Pa., Fri.-Sat., Apr.25-26.

MAY

American Gas Assn., Natural Gas Section, Dallas, Tex., Mon.-Thurs., May 5-8.

Independent Oil Men's Assn. of New England, Annual Convention, Copley Plaza Hotel, Boston, Mass., Thurs., May 8.

Virginia Oil Men's Assn., annual spring meeting, John Marshall Hotel, Richmond, Va., Fri., May 16.

American Institute of Chemical Engineers, 33rd Semi-Annual Meeting, Edgewater Beach Hotel, Chicago, Ill., Mon.-Wed., May 19-21.

American Petroleum Institute, 11th Mid-Year Meeting, Mayo Hotel, Tulsa, Okla., Mon.-Fri., May 19-23.

National Assn. of Purchasing Agents, (Oil Company Buyers' Group) Stevens Hotel, Chicago, Ill., Mon.-Thurs., May 26-29.

National Oil Scouts & Land Men's Assn., Dallas, Tex., Thurs.-Sat., May 29-31.

JUNE

Illinois-Indiana Petroleum Assn., 9th Annual Petroleum Conference, Robinson, Ill., Sat., June 7.

American Society for Testing Materials, 44th Annual Meeting, Palmer House, Chicago, Ill., Mon.-Fri., June 23-27.

SEPTEMBER

American Chemical Society, Atlantic City, N. J., Mon.-Fri., Sept. 8-12.

National Petroleum Assn., Hotel Traymore, Atlantic City, N. J., Wed.-Fri., Sept. 17-19.

National Lubricating Grease Institute, 9th Annual Meeting, Stevens Hotel, Chicago, Ill., Mon.-Tues., Sept. 29-30.

OCTOBER

Texas Mid-Continent Oil & Gas Assn., Beaumont, Tex., Tues.-Thurs., Oct. 9-11.

NATIONAL PETROLEUM NEWS

FEBRUARY 5, 1941

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NEWS BUREAUS

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Tulsa, Okla., 904 World Bldg., Telephone, 3-7132.

Los Angeles, 610-A Hillstreet Bldg., 815 South Hill Street, Telephone, VAndike 2845.

Chicago, 59 E. Van Buren Street, Telephone, Harrison 5901-2-3.

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THIS WEEK WITH NPN

BITTER WITH SWEET

National defense construction projects mean added gallonage for marketers in many states, but there is also a headache involved for marketers because defense industries in some areas are "snatching" skilled employes away from service stations. In this issue, we give you the bitter with the sweet—a round-up on defense projects in 36 states and a news article telling of Ohio marketers losing employes in one of the key defense-industry states. Pages 11 and 25.

GO-BETWEEN

Due to war-time censorship in Holland, a Dutch subscriber writes us that he is unable to contact his daughter on the Isle of Man, island northwest of Ireland in the Irish sea, and asks that NPN write her a letter explaining all is well with her family now in the war zone. While more than glad to oblige any subscriber, we're wondering about international complications, and at present are up to our necks in protocols, precedent, independence of states, freedom of the seas, territorial and maritime domain, and the like, to be assured that delivery of such a message will not draw an ultimatum from Europe's belligerents.

STRIPPERS HAPPY

Although it's now more than a month since we published our semi-humorous Mid-Holiday "Cocktail" issue (Dec. 25), we're still receiving letters from subscribers who approved of the idea. The latest comes from Oklahoma Stripper Well Assn., whose executive vice-president, D. G. Powell, says: "It was a happy blending of business problems with Christmas cheer." Not having a license "to blend", we'd like it understood that Mr. Powell did his own "blending of cheer".

NEXT WEEK

NPN's annual Service Station Gallery will be published next week, showing 1940 changes in station design, interior and exterior. Complete descriptions and drawings will accompany pictures of outstanding service stations. And right in line with 1940's "latest" is a service station article about a $200,000 "department store for motorists."

Shell is now SOLUTIZING *full-range* gasoline

Wood River Refinery . . . . 15,000 bbls/day
Martinez Refinery . . . . . 8,000 bbls/day
Dominquez Refinery . . . . 12,000 bbls/day

A fourth Solutizer Plant under construction

Houston Refinery . . . . . 28,000 bbls/day

THE ADVANTAGES of the Shell Solutizer Process over other sweetening methods are significant.

The mercaptans are removed, not merely oxidized to disulfides. Odor is eliminated and the gasoline's sulfur content is reduced in one operation. And inhibitor response of extracted gasolines is improved.

Even more significant is the improvement obtained in lead response, which offers the refiner substantial savings on leading. There is no octane number loss on treating, and in some instances clear octane number is actually raised.

These advantages over other sweetening methods deserve your study. For complete information, write Shell Development Company, 100 Bush Street, San Francisco.

SHELL

SHELL DEVELOPMENT COMPANY

LICENSORS: Shell Solutizer Process, Shell Phosphate Process,
and Shell Regenerative Mercaptan Removal Process

GMC POWER

HAS NOT BEEN MATCHED

GMC SUPER-DUTY ENGINES ARE STILL THE STRONGEST PULLERS OF ALL

— SIZE FOR SIZE —

General Motors Trucks give the driver the breaks in every way! Steering is as much as 57% easier, with GMC Ball-Bearing Steering. GMC Cradle-Coil Seats introduce real "passenger car riding ease." There's generous leg room for big drivers in GMC's all-steel Rider-Ease Cabs. For comfort and performance, there simply isn't anything like a GMC. See and drive one of these value-built trucks today.

Our own YMAC Time Payment Plan assures you of lowest available rates

GMC TRUCKS

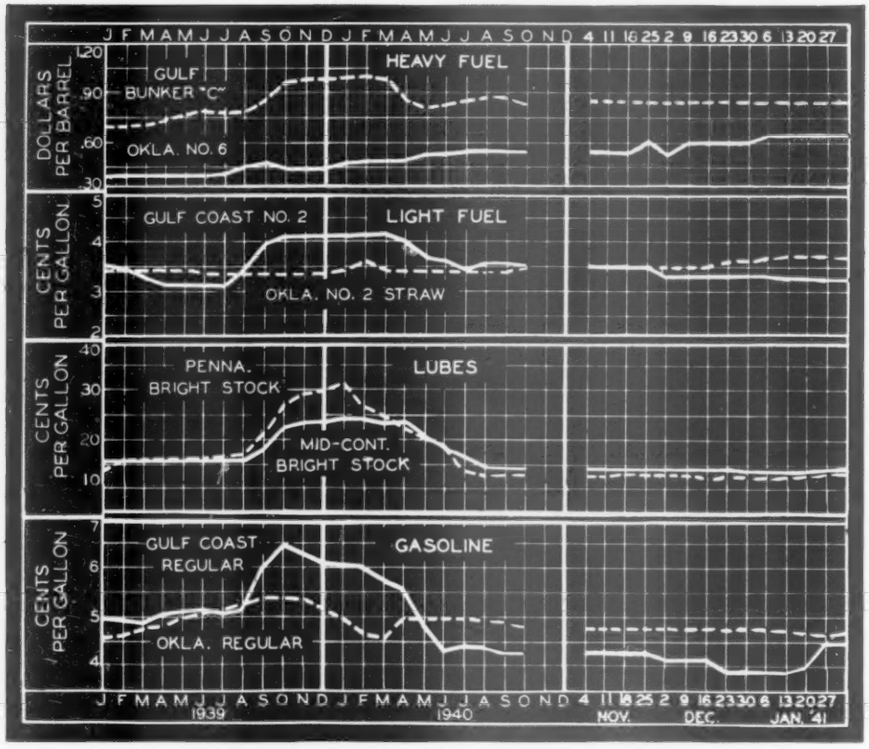
GASOLINE • DIESEL

The Truck of Value

BALL-BEARING Steering that makes GMC Trucks "as easy to steer as your car," has been proved in two years of owner service in medium and heavy-duty General Motors Trucks. Now it is standard in all GMCs, including ½-ton models

•STATISTICS•

REFINERY TANK CAR PRICES



GASOLINE CONSUMPTION BY STATES, NOVEMBER 1940

(Figures in thousands)

	Month of Nov., 1940 Gallons	Month of Nov., 1939 Gallons	% of Change	11 Months Ending With Nov., 1940 Gallons	11 Months Ending With Nov., 1939 Gallons	% of Change
Alabama	23,544	20,916	+12.56	241,617	225,146	+ 7.32
Arizona	9,479	9,244	+ 2.54	103,812	97,285	+ 6.71
Arkansas	17,109	16,106	+ 6.23	174,137	165,757	+ 5.06
California	163,210	156,822	+ 4.07	1,768,235	1,683,824	+ 4.89
Colorado	19,464	18,491	+ 5.26	233,009	220,684	+ 5.58
Connecticut	32,526	30,343	+ 7.19	344,499	323,874	+ 6.37
Delaware	5,064	4,657	+ 8.74	57,841	53,812	+ 7.49
District of Columbia	15,496	12,676	+22.25	152,901	137,193	+11.45
Florida	35,292	30,444	+15.92	367,661	330,109	+11.38
Georgia	34,737	30,206	+15.00	359,021	326,385	+10.00
Idaho	8,724	8,659	+ 0.75	99,484	92,885	+ 7.10
Illinois	127,268	121,339	+ 4.89	1,391,713	1,302,491	+ 6.85
Indiana	60,847	55,976	+ 8.70	664,259	598,894	+10.91
Iowa	46,077	45,992	+ 0.18	530,745	508,052	+ 4.47
Kansas	35,869	31,513	+13.82	467,717	440,964	+ 6.07
Kentucky	24,815	23,170	+ 7.10	265,568	251,379	+ 6.04
Louisiana	24,751	23,479	+ 5.42	251,454	237,822	+ 5.73
Maine	12,325	12,014	+ 2.59	146,478	139,686	+ 4.86
Maryland	26,650	24,334	+ 9.52	288,277	267,572	+ 7.74
Massachusetts	63,649	59,814	+ 6.41	685,939	662,189	+ 3.59
*Michigan	.....	.....	.....	.....	.....	.....
Minnesota	45,080	47,621	— 5.34	543,964	511,182	+ 6.41
Mississippi	18,531	18,106	+ 2.35	200,343	190,848	+ 4.98
Missouri	60,475	55,751	+ 8.47	636,048	599,560	+ 6.09
Montana	10,128	10,143	— 0.15	129,079	118,409	+ 9.01
Nebraska	18,602	19,845	— 6.26	218,907	216,996	+ 0.88
Nevada	3,525	3,239	+ 8.83	40,596	40,737	— 0.35
New Hampshire	7,373	7,084	+ 4.08	88,424	85,940	+ 2.89
New Jersey	78,188	72,936	+ 7.20	845,655	800,974	+ 5.58
New Mexico	8,923	8,644	+ 3.23	101,363	93,598	+ 8.30
New York	164,360	156,513	+ 5.01	1,817,864	1,751,114	+ 3.81
North Carolina	40,255	36,334	+10.79	416,918	391,809	+ 6.41
North Dakota	9,749	9,970	+ 2.22	144,992	123,823	+17.10
Ohio	124,965	117,400	+ 6.44	1,352,066	1,257,929	+ 7.48
Oklahoma	35,029	33,632	+ 4.15	408,597	392,701	+ 4.05
Oregon	20,749	20,188	+ 2.78	243,102	226,415	+ 7.37
Pennsylvania	134,190	127,731	+ 5.06	1,450,719	1,359,448	+ 6.71
Rhode Island	11,340	10,154	+11.68	122,907	118,026	+ 4.14
South Carolina	20,460	17,648	+15.93	213,037	193,815	+ 9.92
South Dakota	9,653	10,947	—11.82	134,686	123,263	+ 9.27
Tennessee	29,873	21,897	+36.43	297,768	262,006	+13.65
Texas	116,405	107,203	+ 8.58	1,300,775	1,227,072	+ 6.01
Utah	9,561	8,397	+13.86	99,270	91,593	+ 8.38
Vermont	5,666	5,310	+ 6.70	65,890	63,139	+ 4.36
Virginia	36,739	31,810	+15.50	381,216	350,398	+ 8.80
Washington	30,135	28,045	+ 7.45	349,672	322,276	+ 8.50
West Virginia	20,397	19,348	+ 5.42	203,450	189,143	+ 7.56
Wisconsin	48,416	48,679	— 0.54	548,191	525,387	+ 4.34
Wyoming	5,389	5,072	+ 6.25	65,897	63,073	+ 4.48
Total	1,911,052	1,795,842	+ 6.42	21,014,763	19,756,677	+ 6.37
Daily Average	63,702	59,861	+ 6.42	62,731	59,152	+ 6.05
Change from previous year:						
Total change	+115,210	.....	.....	+1,258,086	.....	.....
Percentage change in Daily Average	+6.42%	.....	.....	+6.05%	.....	.....

*Michigan figures not available at time of publication.

N.P.N. Gasoline Index

	Dealer T.W.	Tank Car
	Cents Per Gallon	
Feb. 3	8.58	5.12
Month ago	8.56	5.00
Year ago	9.72	5.92

Dealer index is an average of "undivided" dealer prices, ex-tax, in 50 cities.

Tank car index is a weighted average of 9 wholesale markets for regular-grade gasoline.

N. P. N. Refinery Index

The Refinery Index shown below represents the return in cents per barrel (42 gallons) from refining a barrel of 36 gravity Mid-Continent crude into its various principal products. The index is calculated by subtracting the current price of crude at the well from the average price of refined products sold at current quoted Oklahoma refinery prices.

Date	Margin
Feb. 3	46.6
Month ago	48.8
Year ago	48.4

Mid-Continent Gasoline Statistics

(Compiled by Western Petroleum Refiners Assn. from reports of 38 companies operating 46 plants in Mid-Continent area. Figures in barrels of 42 gallons)

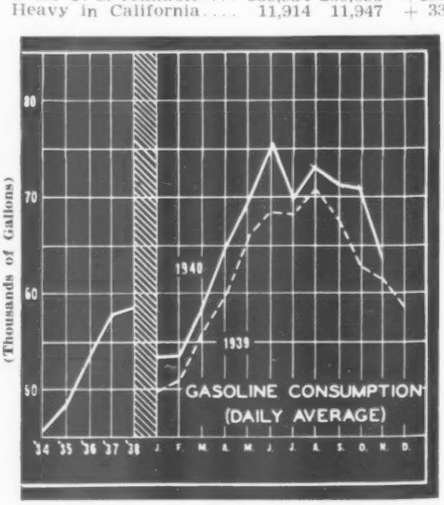
	Gasoline Production	Gasoline Shipments	Inventory End of Mo.
1939			
December	6,167,264	5,356,916	5,546,933
1940			
January	5,824,956	4,899,924	6,471,965
February	5,463,485	4,634,875	7,300,575
March	5,736,741	5,600,595	7,436,721
April	5,702,968	6,198,006	6,941,683
May	6,283,212	6,687,474	6,537,421
June	6,407,822	7,620,968	5,324,275
July	6,123,869	6,281,725	5,166,419
August	6,266,292	6,833,309	4,599,402
September	6,335,313	6,343,765	4,590,950
October	6,354,515	6,616,521	4,328,944
November	6,155,431*	5,770,984*	4,713,391
December	6,157,386	5,477,664	5,423,113

*Revised.

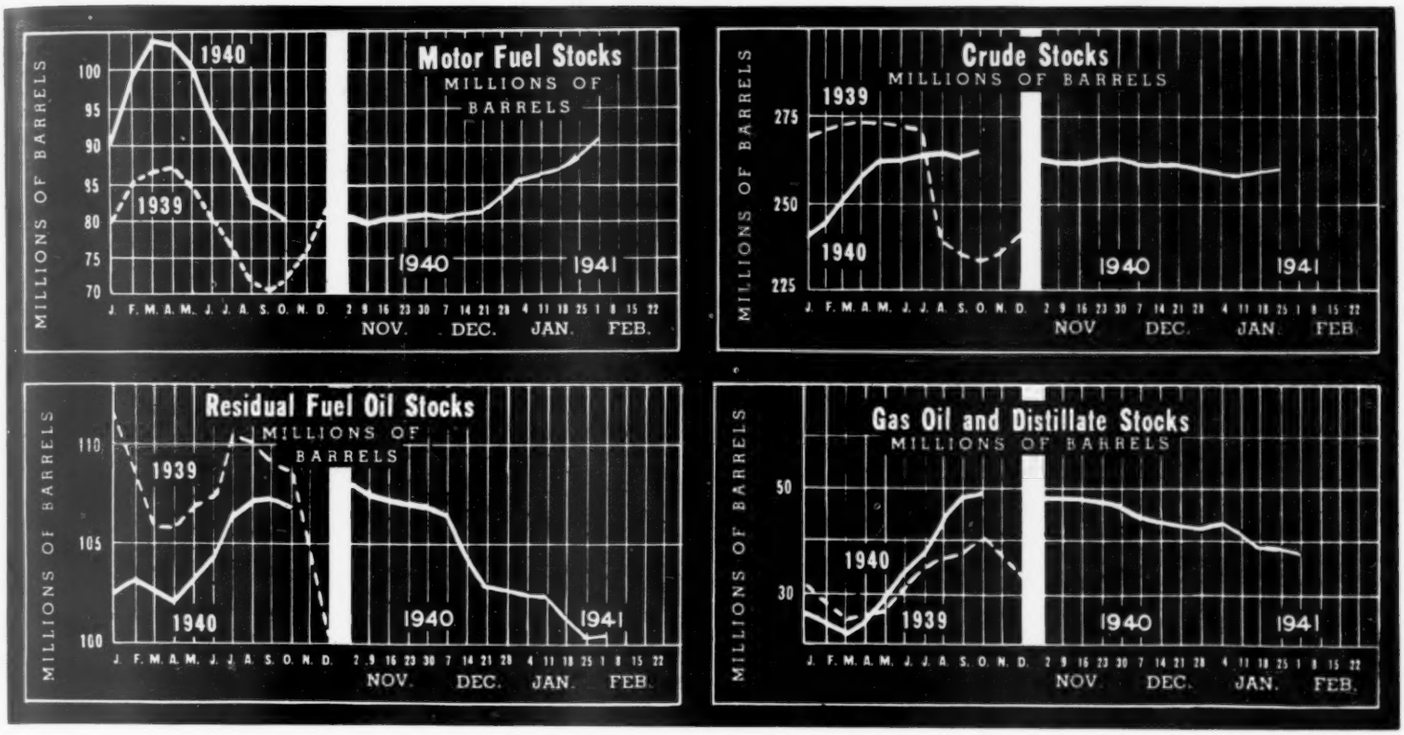
Crude Oil Stocks

(U. S. Bureau of Mines figures, thousands of barrels)

Grade or origin	Jan. 18	Jan. 25	Change from Jan. 18
Pennsylvania Grade	4,326	4,292	— 34
Other Appalachian	1,356	1,275	— 81
Lima-Michigan	1,241	1,240	— 1
Illinois-Indiana	20,320	20,185	—135
Arkansas	3,668	3,481	—187
Kansas	8,633	8,877	+244
Louisiana:	12,652	12,854	+202
Northern	4,328	4,368	+ 40
Gulf Coast	8,324	8,486	+162
Mississippi	941	1,028	+ 87
New Mexico	7,134	7,460	+326
Oklahoma	63,778	64,027	+249
Texas:	82,372	82,079	—293
East Texas	18,380	18,168	—212
West Texas	17,583	17,740	+157
Gulf Coast	19,857	19,641	—216
Other Texas	26,552	26,530	— 22
Rocky Mountain	15,017	14,897	—120
California	35,859	36,014	+155
Foreign	2,637	2,384	—253
Total U. S. refinable	259,934	260,093	+159
Heavy in California	11,914	11,947	+ 33



•STATISTICS•



A. P. I. Weekly Refinery Report

(Figures in Thousands of Barrels of 42 Gallons Each)

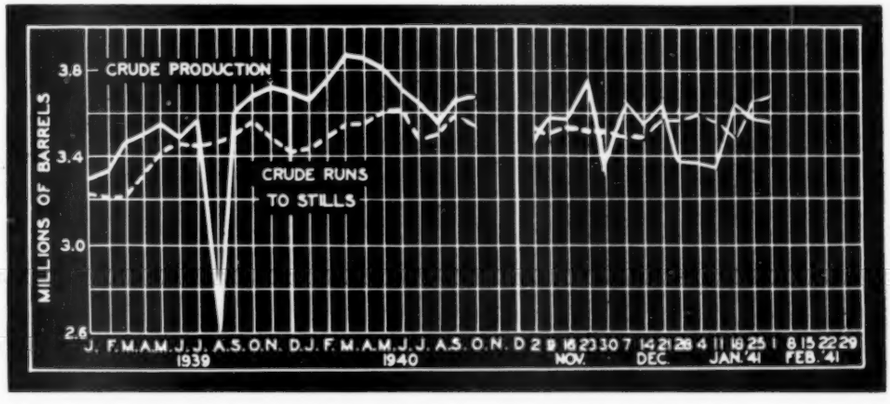
Districts	Daily Average Crude to Stills Week Ended Feb. 1	Daily Average Crude to Stills Week Ended Jan. 25	Per Cent of Reporting Capacity Operated Week Ended Feb. 1	Per Cent of Reporting Capacity Operated Week Ended Jan. 25	†Gasoline Production Week Ended Feb. 1	†Gasoline Production Week Ended Jan. 25	Total Stocks Finished and Unfinished Motor Fuel‡ Week Ended Feb. 1	Total Stocks Finished and Unfinished Motor Fuel‡ Week Ended Jan. 25	Total Stocks of Gas Oil & Distillates Week Ended Feb. 1	Total Stocks of Gas Oil & Distillates Week Ended Jan. 25	Total Stocks of Residual Fuel Oil Week Ended Feb.1	Total Stocks of Residual Fuel Oil Week Ended Jan. 25
East Coast	548	544	85.2	84.6	1,538	1,375	19,062	18,317	13,731	14,292	9,543	9,897
Appalachian	133	138	93.7	97.2	460	456	3,304	3,210	443	471	429	411
Ind., Ill., Ky.	588	550	87.8	82.1	2,251	2,130	16,979	16,352	3,634	3,818	2,930	2,908
Okla., Kans., Mo.	284	284	87.9	87.9	§975	§908	7,969	7,656	1,259	1,374	2,038	2,072
Inland Texas	110	114	65.9	68.3	571	499	1,999	2,016	392	441	1,519	1,533
Texas Gulf	917	933	96.0	97.7	2,853	2,847	13,720	14,064	6,358	6,669	7,569	7,568
La., Gulf	138	133	86.3	83.1	358	344	3,148	2,926	982	985	2,251	2,194
No. La., Ark.	49	47	94.2	90.4	152	143	529	529	317	326	480	461
Rocky Mt.	53	56	77.9	82.4	214	238	1,429	1,364	162	167	436	456
California	518	484	71.0	66.3	1,562	1,333	16,225	15,928	9,716	9,831	71,518	71,082
Total Reporting	3,338	3,283	85.4	84.0	10,934	10,273	84,364	82,362	36,994	38,374	98,713	98,582
U. S. Total**	3,680	3,625			12,424	11,673	90,864	88,762	37,634	39,039	100,428	100,297
U. S. Total 2-1-40**	3,436				11,061		90,975		26,462		102,666	

†Includes straight-run, cracked and natural blended. ‡Includes stocks at refineries, in bulk-terminals, pipe lines and in transit. §12% of reporting capacity in this district did not report gasoline production. **Estimated, U. S. Bureau of Mines basis.

U. S. Crude Oil Production

(American Petroleum Institute figures)

	—Week Ended— Feb. 1 Barrels (Daily Average)	Jan. 25 Barrels (Daily Average)
Oklahoma	398,600	396,000
Kansas	198,000	199,400
Nebraska	2,550	2,650
Texas	1,337,200	1,337,900
Louisiana	290,500	289,500
Arkansas	70,650	70,000
Mississippi	19,000	16,950
Illinois	326,000	325,200
Indiana	19,800	20,650
Eastern (Ill. and Ind. excl.)	92,900	91,500
Michigan	39,950	40,300
Wyoming	74,800	75,500
Montana	18,900	18,400
Colorado	3,600	3,600
New Mexico	100,700	100,650
California	597,000	610,900
Total U. S.	3,590,150	3,599,100
Crude Imports	107,715	76,290
Total New Supply	3,697,865	3,675,390



New Chairman of A.P.I. Lube Committee

L. C. Welch

● Newly-appointed chairman of the American Petroleum Institute's Lubrication Committee is L. C. Welch who started his career with oil in 1906 as a machinist's helper in the pipeline division of Ohio Oil Co.; salary, $70 a month.

Today, Mr. Welch is assistant general manager in charge of lubricating and sales technical service departments of Standard Oil Co. of Indiana, with headquarters in Chicago.

Lube Committee Chairman Welch was graduated from Cornell University in 1906 with a degree in mechanical engineering, and during his collegiate days was catcher for the baseball team for four years and captain for two.

In 1907, he became a civil and mechanical engineer at Oil City, Pa., for the Buckeye Pipe Line Co., Northern Pipe Line Co. and National Transit Co. Two years later, he was made assistant division superintendent for the companies and in 1911 advanced to division superintendent for the Buckeye Pipe Line Co., Cleveland.

After spending 10 years with trunk pipelines, he worked three months with Imperial Oil, Ltd., Sarnia, Ont., Canada, in 1917, familiarizing himself with refinery construction preparatory to accepting a position that year with Midwest Refining Co. as chief engineer in charge of refinery construction at Casper, Wyo. Upon completion of a lubricating plant at Casper in 1919, Mr. Welch was appointed manager of lubricating sales for Midwest with headquarters at Denver.

Standard of Indiana through an exchange of stock virtually purchased Midwest in 1921, and the next year Mr. Welch was transferred from Denver to Chicago and assumed responsibility for the bulk lubricating sales of Indiana Standard in addition to those of Midwest.

In 1925, he was made manager of the lubricating department of the Indiana Standard and its subsidiaries, including Midwest, which was merged with Standard in 1930. In 1934, Mr. Welch was promoted to assistant general manager in charge of lubricating and sales technical service departments.

Mr. Welch is a member of the American Society of Mechanical Engineers, Society of Automotive Engineers, Beta Theta Pi, University Club of Chicago and Glen View, Ill., Golf Club.

NATIONAL PETROLEUM NEWS

VOLUME 33 WEDNESDAY, FEBRUARY, 5, 1941 NUMBER 6

Three 'Gas' Pump Firms Charged with 'Monopoly'

Burner Shipments Rise 22.9% During 1940

WASHINGTON, Feb. 3. — Shipments of oil burners during 1940 totaled 264,232 units, an increase of 22.9% from 215,030 burners shipped during 1939, and 89.8% greater than the 139,211 shipped during 1938.

Shipments of burners during December, 1940, totaled 16,535 units, compared with 13,300 in the same month last year, and 8824 in December, 1938.

Federal 'Gas' Tax Receipts Increase In 1940

WASHINGTON, Feb. 1.—Federal gasoline tax collections in 1940 totaled $281,653,761, compared with $215,217,325 in 1939, according to announcement this week of Internal Revenue Bureau. Tax rate was raised from 1c to 1.5c on July 1, 1940.

* * *

All Charges Denied By Pump Companies

CLEVELAND, Feb. 4.—Denial of charges of anti-trust law violation were made by The Wayne Pump Co. and Tokheim Oil Tank and Pump Co. in statements received today from these two companies by NATIONAL PETROLEUM NEWS. Complete

Wayne Statement Quoted

Wayne company's statement, prepared by C. L. Byron, its patent counsel, follows:

"I assert that the gasoline pump industry has done nothing in violation of the anti-trust laws. The Wayne Pump Company of Fort Wayne, Indiana, developed the computer type of gasoline pump for service stations and has patents covering same. The use of this type of pump insures that the public will pay only for the gasoline it receives.

"Instead of trying to monopo-

(*Continued on page* 13)

N. P. N. News Bureau

CHICAGO, Feb. 3. — Three leading gasoline pump companies are under indictment here on charges of price-fixing and conspiracy to monopolize the manufacture and sale of computer pumps and computing mechanisms.

Indictment was returned Jan. 31 by federal grand jury here, following an investigation of alleged violations of the Sherman anti-trust law. Charges were presented to grand jury by attorneys for anti-trust division of Department of Justice. Alleged misuse of patent privileges is the basic charge.

Besides the three pump companies, defendants named included officers of two of these companies, a computing mechanism company and two of its officers, a gasoline pump trade association and its secretary. The president of the third pump company defendant was named as "co-conspirator" but not indicted.

Two Indictments Returned

Two indictments were returned. One, with two counts, charges (1) a monopoly in the manufacture and sale of computing pumps and (2) a monopoly in the manufacture and sale of computer mechanisms for pumps. The other indictment charges a conspiracy to fix prices; it has the same defendants but adds the names of the association and its secretary.

Defendants Listed

Defendants named in both indictments were: The Wayne Pump Co., Fort Wayne, Ind.; B. F. Geyer, Fort Wayne, president of the Wayne company; Tokheim Oil Tank and Pump Co., Fort Wayne, Ind.; Gilbert and Barker Manufacturing Co., West Springfield, Mass.; S. C. Hope, Springfield, Mass., president of Gilbert and Barker; Veeder-Root, Inc., Hartford, Conn.; and G. H. Anthony and J. H. Chaplin, both of Hartford, Conn., president and vice-president, respectively, of Veeder-Root (the computing mechanism manufacturer).

The price-fixing indictment lists the above as defendants and adds: Gasoline Pump Manufacturers Assn., New York, and G. Denny Moore, White Plains, N. Y., association secretary.

Named as a "co-conspirator" in both indictments—but not included in either as a defendant, was C. M. Niezer, Fort Wayne, Ind., president of Tokheim.

(Two pump companies have already denied anti-trust law violations, see news item on this page—Editor.)

Results of 'Conspiracy' Alleged

As a result of the alleged conspiracy, the indictments charge —among other things—that a number of gasoline pump manufacturers were eliminated from the field, that use of computer mechanisms to modernize non-computer pumps was prevented, that manufacture of computing mechanism has been restricted to defendant Veeder-Root and manufacture of computing pumps limited to Wayne and its licensees, that litigation threatening validity of the Jauch computer patent (owned by Wayne) was prevented and that pump prices were fixed and salesmen's commissions and equipment jobbers' discounts set.

The "combination and conspiracy" charges in both counts of the monopoly indictment are the same, except for a change in wording to charge. In one in-

(*Continued on page* 12)

Jobs in Defense Plants Lure Service Station Men in Ohio

N. P. N. News Bureau

CLEVELAND, Feb. 3.—Oil marketing is rapidly coming face to face with a serious labor problem arising out of the defense program.

This is particularly true in Ohio, the center of the country's tool and die making industry, according to reports from oil companies operating in the Buckeye state. Several huge ammunition plants and other defense projects are also being constructed in this state.

Marketers over Ohio report that the problem of losing employes, especially at service stations, has resulted from two developments:

1—Drift of service station employes and lessees to more lucrative employment in industry which is booming because of defense preparations.

2—Loss of employes due to draft and enlistment.

As yet, the first development is the most outstanding. One oil company with 6000 employes reports that only 6 have as yet been drafted. However, 29 of its employes have gone into service, most of whom would probably have been drafted.

Manufacturers working on defense orders have been scouring the labor marts for men with trades. They are casting longing eyes at young men working in service stations who, according to an Ohio Bureau of Unemployment official, have "the ability to handle tools, and who are not afraid to get their hands dirty."

The state official reports one manufacturer asked them for a list of young men with an aptitude for working with tools who had been placed by the bureau in service stations in the past year. This request was refused by the state bureau, but it indicates the competition which is developing for skilled and semi-skilled workers, he said.

Merely 'Stop-Gap'

Oil company personnel directors and oil marketers report that many station employes, especially leased-station operators, took this work as a stop-gap between employment in other industries, waiting for the industrial revival. And now this has been brought about by the defense program.

To many of them, one oil company official said, working or operating a service station was the means of keeping off relief or making "bread money" during the period of slack employment in their own lines. Now, they have started to seek re-employment in their own trades.

Several Ohio marketers re-

(*Continued on page* 24)

'DJ' Explains Pump Charges

N. P. N. News Bureau

CHICAGO, Feb. 1.—Following is complete text of the statement issued by the Department of Justice announcing the two indictments involving gasoline pump companies, returned Jan. 31 by federal grand jury here:

DEPARTMENT OF JUSTICE
Statement to the Press

"The Federal Grand Jury sitting in Chicago, which has been investigating alleged violations of the Sherman Act, involving a misuse of patent privileges by members of the gasoline pump industry, today returned two indictments. One indictment charges in the first count the establishment by the defendants of a complete monopoly in the manufacture and sale of computer pumps, and charges in the second count the establishment by the defendants of a

(*Continued on page* 12)

Three 'Gas' Pump Companies Named in Monopoly Charge

(*Continued from page* 11)

stance, the charge was that patent privileges were misused to monopolize the manufacture and sale of computer pumps and, in the other, that the monopolistic purpose concerned computing mechanisms.

In stating the "combination and conspiracy," the price-fixing indictment includes all charges of the other indictment (except the above-mentioned monopolistic purpose charged as to computers and computing mechanisms), plus the added charges of price-fixing and alleged use of the pump association as an instrument to enforce prices and pricing policies, allegedly set by defendant Wayne.

(Complete text of the "combination and conspiracy" charge in the price-fixing indictment is on page 13.)

Goes Back to 1932

Prior to the allegations of "combination and conspiracy," the indictments recite a number of alleged developments which, briefly, were:

"On or about November 22, 1932" the U. S. Patent Office issued the "Jauch Patent" on a computer pump to certain employes of the Wayne Company. They immediately assigned the patent to Wayne Company. Under this patent, Wayne has licensed other pump manufacturers to make and sell computer pumps.

Wayne arranged with defendant Veeder-Root to develop and manufacture computing mechanisms, using Veeder-Root's facilities and patents. Veeder-Root restricted sale of computing mechanisms to Wayne, Gilbert and Barker, Tokheim and such other gasoline pump manufacturers as were permitted by these three to buy mechanisms from Veeder-Root.

During period covered by indictment (1932 to date) Neptune Meter Co. for a while manufactured and sold computing mechanisms to other pump manufacturers who used such mechanisms in computer pumps sold in competition with those of Wayne, Gilbert and Barker, and Tokheim. Other pump manufacturers also produced computing mechanisms during this period.

Since 1938, however, Veeder-Root has been sole manufacturer in the U. S. of computing mechanisms used in computer pumps.

'Facts' of Case Cited

After stating the "conspiracy" charge, the indictments next declared that it was effectuated by "the following acts and things" which alleged facts, briefly, were:

Defendant Tokheim during 1934 consented to licensing, by Wayne under the Jauch patent, of gasoline pump manufacturers purchasing Neptune's computing mechanism and manufacturers using computing mechanisms of their own make in the manufacture of computer pumps.

On or about Jan. 2, 1935, defendant Wayne, with consent of G & B and Tokheim, issued a license under the Jauch patent to John Wood Manufacturing Co., Inc., a gasoline pump manufacturer using its own computing mechanisms to make computer pumps.

Prior to grant of such license, U. S. Patent Office had declared that a computing mechanism patent, controlled by John Wood Manufacturing Co., Inc., to be "in interference with the Jauch patent" (an "interference" is a proceeding instituted by the patent office to determine who is the first inventor and entitled to the patent).

Wayne, as a condition of licensing John Wood, required the licensee to file with the patent office in January, 1935, a "concession of priority" to the Jauch patent.

About June, 1935, Wayne, with consent of G & B and Tokheim, offered Neptune a license if Neptune would acknowledge validity of the Jauch patent and accept other conditions. Neptune refused. At about same time, Neptune likewise refused Wayne's offer to sell to Neptune the Jauch patent and other patents, if Neptune would agree to administer the licenses already issued by Wayne on terms, conditions and prices established by Wayne.

During 1935, defendant Wayne, with approval of G & B and Tokheim, instituted an infringement suit against a user of a computer pump having a Neptune computing mechanism. Suit was defended by Neptune. During 1937, Wayne and Neptune settled the suit, with Neptune acknowledging validity of the Jauch patent, agreeing to refrain from manufacturing computing mechanisms except with approval of Wayne and accepting other conditions set by Wayne.

During 1938, Wayne demanded that they enter into new licensing agreements. With exception of Martin & Schwartz, Inc., such licensees entered in substitute license agreements.

* * * *

D.J. Statement Summarizes Gasoline Pump Indictments

(*Continued from page* 11)

complete monopoly on the manufacture and sale of computing mechanisms. The other indictment charges the defendants with fixing arbitrary and noncompetitive prices, including discounts and salesmen's commissions, on the sale of computer pumps.

"The monopoly indictment names the following corporations and individuals as defendants in each of the two counts:

The Wayne Pump Company
Fort Wayne, Indiana
Tokheim Oil Tank and Pump Company.
Fort Wayne, Indiana
Gilbert and Barker Manufacturing Company
West Springfield, Massachusetts
Veeder-Root, Incorporated
Hartford, Connecticut
B. F. Geyer, President of The Wayne Pump Company
Fort Wayne, Indiana
S. C. Hope, President of Gilbert and Barker Manufacturing Co.
Springfield, Massachusetts
G. H. Anthony, President of Veeder-Root, Incorporated
Hartford, Connecticut
J. H. Chaplin, Vice President of Veeder-Root, Incorporated
Hartford, Connecticut

"The price fixing indictment names the same corporations and individuals as defendants, and in addition the following:

Gasoline Pump Manufacturers Association
New York, New York
G. Denny Moore, Secretary of the Association
White Plains, New York

"Both indictments name C. M. Niezer of Fort Wayne, Indiana, President of Tokheim Oil Tank and Pump Company, as a co-conspirator but not as a defendant.

"Both the monopoly and the price fixing indictments point out the importance of gasoline pumps in an automobile economy and show how the computer or 'cash register' type of gasoline pump has come to dominate the gasoline pump market. An indispensable part of the computer pump is the computing mechanism or 'cash register' device which simultaneously calculates and records both the quantity and price of the gasoline purchased by the customer at the gasoline filling station.

"The indictments charge that Wayne, Gilbert and Barker, and Tokheim, the 'Big Three' of the gasoline pump industry, used certain patents owned by Wayne, to establish the monopoly on computer pumps, the monopoly on computing mechanisms, and to fix prices on computer pumps. Wayne, in playing its part in the conspiracy, secured control of all patents in the computer pump field. Veeder acquired certain patents on mechanisms and turned these over to Wayne and received its reward in the form of obtaining a monopoly on the manufacture and sale of computing mechanisms for use in computer pumps. These mechanisms were sold by Veeder only to the 'Big Three' and to others who were permitted by the 'Big Three' to buy the mechanisms. The indictments charge that when the Neptune Meter Company commenced making computing mechanisms in competition with Veeder, and selling them to pump manufacturers other than the 'Big Three,' that the latter licensed Neptune's customers and then forced Neptune to stop making the mechanisms except on terms fixed by the 'Big Three' and forced Neptune to make its computer patents available to uses established by Wayne.

"The indictment charges that when independent gasoline pump manufacturers developed their own computing mechanisms they were induced to take licenses from Wayne. These licenses gave Wayne control over the licensees' computer patents and gave Wayne the power to fix the prices at which the licensee could sell computer pumps. Owners of patents which threatened the validity of certain of Wayne's patents were induced to file concessions of priority to Wayne's patents in the United States Patent Office.

"The indictment charges that Wayne, on obtaining control of all sources of computing mechanisms in the country, forced its smaller licensees, on threat of cancelling their licenses, to take new licenses containing more onerous terms and protecting Wayne's patents in perpetuity. The indictment charges that after Wayne's smaller licensees were forced to take these new licenses that Wayne arbitrarily cancelled the license of the smallest of its licensees and forced it out of business.

"The price fixing indictment charges that the 'Big Three' decided on the prices and terms at which the computer pumps would be sold and that the Association help police the industry to see that these prices and terms were followed. Resale prices were established for jobbers and when they failed to adhere to these prices the 'Big Three' forced Wayne's licensees to give Wayne the power to fix jobber discounts. Wayne then cancelled discounts to jobbers and forced them out of the business of buying and selling

computer pumps. From time to time Wayne also slashed the commissions which would be paid to salesmen of computer pumps.

"The indictment charges that the defendant Veeder has a complete monopoly on the manufacture of computing mechanisms and that the 'Big Three' and their smaller licensees make 100% of the computer pumps sold in the country and 99% of all gasoline pumps.

"Leo F. Tierney, Special Assistant to the Attorney General, in charge of the Chicago office of the Antitrust Division supervised the investigation. Assisting Mr. Tierney were Willis L. Hotchkiss, Special Attorney who has been in direct charge of the investigation and Grand Jury proceedings, Daniel B. Britt, Special Assistant to the Attorney General, and Robert Diller and James Cramond, Special Attorneys."

All Charges Denied By Pump Companies

(*Continued from page* 11)

lize the gasoline pump business, The Wayne Pump Company granted licenses to its competitors to manufacture the patented computer pump thereby creating increased competition for itself rather than stifling competition, all to the benefit of the public.

"The Wayne Pump Company did not have to grant licenses to its competitors and could have sold the computer pump at any price it could have procured. However, in granting licenses to its competitors in accordance with the law, The Wayne Pump Company fixed a minimum selling price at which the patented pumps could be sold by its competitors and by itself. This is no violation of the anti-trust laws. Furthermore, the fixing of prices on patented articles is permitted under all decisions of the United States Supreme Court bearing on that point. The average net profit per patented pump sold by the manufacturers is not in excess of 4% of the selling price. The pumps are sold by the manufacturers directly to the consumers."

Tokheim's Statement to NPN

Tokheim's statement was in form of a letter to NPN, signed by C. C. Oberly, vice-president and general manager. Letter follows in full text:

"This will acknowledge and reply to your letter of February 1st, relative above subject, and also will confirm our telegram to you of today.

"In response to your inquiry regarding the indictment of the Federal Grand Jury charging certain Gasoline Pump Manufacturers with establishing a monopoly in the manufacture and sale of the computer type gasoline pump, will state that in our opinion we do not believe that the manufacturers are guilty of any violation of the existing laws.

"The computer type gasoline

(*Continued on page* 19)

'Conspiracy' Charge Quoted From 'Gas' Pump Indictment

N. P. N. News Bureau

CHICAGO, Feb. 3.—Complete text of the "combination and conspiracy" charge in the gasoline pump price-fixing indictment returned Jan. 31 by federal grand jury here is printed below. This charge is similar to charges in the other indictment, except for several sentences concerning alleged purpose to monopolize computer pump and computing mechanism business (see general story on indictments, beginning on page 11 of this issue).

Text of the "combination and conspiracy" charge, as set forth in the price-fixing indictment, follows:

THE COMBINATION AND CONSPIRACY

[26] The Grand Jurors aforesaid, upon their oaths aforesaid, do further present that all the defendants herein and other persons to the Grand Jurors unknown, well knowing all the facts alleged in this indictment, beginning in or about the year 1932, the exact date being to the Grand Jurors unknown, and continuously thereafter up to and including the date of the presentation of this indictment, knowingly have entered into and engaged in a combination and conspiracy to fix, maintain, and control arbitrary, artificial and non-competitive prices for the sale of computer pumps in the aforesaid interstate trade and commerce, which combination and conspiracy, in fact, has been and is now in restraint of trade and commerce in computer pumps among the several states and in violation of Section 1 of the Act of Congress of July 2, 1890 entitled "An Act To protect trade and commerce against unlawful restraints and monopolies" (U. S. C. A., Title 15, Section 1), commonly known as the Sherman Act; which combination and conspiracy is now described in further detail, that is to say:

[27] It is and has been a part of said combination and conspiracy that the defendants Wayne, G & B, and Tokheim use the Jauch patent owned by Wayne for the purpose of fixing prices among themselves on their sales of computer pumps; that the defendant Wayne license the defendants G & B and Tokheim under the Jauch patent to make, use and sell computer pumps; that the defendants Veeder, G & B, and Tokheim acknowledge the validity of the Jauch patent; that the defendant Wayne acquire, by purchase or otherwise, ownership or control of all patents on computing mechanisms and computer pumps capable of competing with computing mechanisms manufactured by Veeder or with computer pumps manufactured by Wayne, G & B, and Tokheim; that the defendant Veeder convey to Wayne ownership or control of all patents covering computing mechanisms and vital parts thereof developed by Veeder or its employees; that the defendant Veeder acquire, by purchase or otherwise, ownership or control of patents on computing mechanisms capable of competing with computing mechanisms manufactured by Veeder or with computer pumps manufactured by Wayne, G & B, and Tokheim and convey ownership or control of such patents to Wayne; that the defendant Wayne determine the use of all patents on computing mechanisms and computer pumps and improvements thereon owned or controlled by either of the defendants G & B and Tokheim; that the defendant Wayne secure for itself and its gasoline pump manufacturer licensees special rights under patents on devices pertaining to the operation of computer pumps which are required by State Sealers or Fire Underwriters; that the defendant Wayne cause owners of all patents which the United States Patent Office declares to be in interference with the Jauch patent, to file in said Patent Office concessions of priority to the Jauch patent; that the defendants Wayne, G & B, and Tokheim purchase computing mechanisms only from the defendant Veeder; that Veeder sell computing mechanisms for use in the manufacture of computer pumps only to Wayne, G & B, and Tokheim and other purchasers approved by Wayne, G & B, and Tokheim; that the defendants Wayne, G & B, and Tokheim devise a formula for determining minimum prices for the sale of computer pumps; that the defendant Wayne, on the basis of aforesaid formula, determine prices for the sale of computer pumps; that the defendants Wayne, G & B, and Tokheim also determine other terms and conditions for the sale of computer pumps, including discounts and salesmen's commissions; that the defendant Wayne from time to time issue announcements and regulations stating and interpreting the aforesaid prices, discounts, commissions, terms and conditions; that the defendants Wayne, G & B, and Tokheim, in selling computer pumps, adhere to the prices, discounts, commissions, terms and conditions contained in the aforesaid announcements and regulations; that the said defendants determine jobbers' resale prices for computer pumps, refuse to sell computer pumps to any jobber failing or refusing to adhere to such resale prices, and eliminate discounts to all jobbers in the event of a general failure by jobbers to adhere to the said resale prices; that the said defendants, in determining salesmen's commissions as aforesaid, lower them from time to time and require discounts to be deducted from said salesmen's commissions; that the said defendants refrain from using computing mechanisms to convert non-computer pumps into computer pumps; that the said defendants refuse to sell computing mechanisms for use in converting non-computer pumps into computer pumps; that the said defendants restrict and discourage the sale of non-computer pumps and vigorously promote the sale of computer Wayne license no others than pumps; that the defendant G & B and Tokheim under the Jauch patent except with the consent of G & B and Tokheim and upon terms authorized by G & B and Tokheim; that the defendant Wayne with the consent of the defendants G & B and Tokheim approach gasoline pump manufacturers purchasing computing mechanisms from Neptune and all gasoline pump manufacturers using computing mechanisms of their own make in the manufacture of computer pumps, induce each of such manufacturers to accept a license under the Jauch patent, and, with the authorization of G & B and Tokheim, issue such license to each of such manufacturers on terms securing to the defendants Wayne, G & B, and Tokheim control of all of the new licensee's patents on computing mechanisms and computer pumps and of the licensee's prices for the sale of computer pumps; that the defendant Wayne with the consent of G & B and Tokheim compel Neptune, the sole manufacturer and seller of computing mechanisms other than Veeder, to forever acknowledge the validity of the Jauch patent, to submit all patents on computer pumps and computing mechanisms owned or controlled by Neptune to uses determined by Wayne, to refrain from manufacturing computing mechanisms except with the approval of Wayne, and to refrain from selling computing mechanisms except to customers approved by Wayne, G & B, and Tokheim; that the defendants Wayne, G & B, and Tokheim share royalty payments secured from the aforesaid new licensees; that the defendants Wayne, G & B, and Tokheim share litigation expenses incurred in enforcing the terms of the aforesaid new licenses; that the defendant Wayne charge each of such new licensees with violations of its license, and under threat of cancellation of the license and imposition of liquidated damages, demand that each of such licensees accept a substitute license, and issue such license to each of said licensees on terms securing to Wayne, G & B, and Tokheim control of the ownership and official personnel of the licensee and protecting the Jauch patent in perpetuity; that the defendant Association, at meetings of its gasoline pump manufacturer members, consider ways and means of en-

forcing the provisions of the aforesaid licenses and the price and other regulations issued by Wayne as aforesaid; that the defendant Association at meetings of sales managers and salesmen employed by the defendant Wayne and its gasoline pump manufacturer licensees instruct, persuade, and compel such persons to adhere to the prices, discounts, commissions, terms, and conditions for the sale of computer pumps agreed upon by the defendants Wayne, G & B, and Tokheim; that the defendant Association urge and compel jobbers to adhere to the resale prices on computer pumps agreed upon by defendants Wayne, G & B, and Tokheim; and that the defendant Association collect and transmit to the other defendants information relating to the sales and prices of computer pumps.

Gasoline Pump Makers' Alleged Acts Recited In Anti-Trust Indictment

[28] For the purpose of effectuating the aforesaid combination and conspiracy the defendants have regularly and continuously entered into those agreements and done those things which, as hereinbefore alleged, they have combined and conspired to do and more particularly have done, among other, the following acts and things:

The defendant Tokheim during 1934 gave its consent to the licensing by Wayne under the Jauch patent of gasoline pump manufacturers purchasing Neptune's computing mechanism and gasoline pump manufacturers using computing mechanisms of their own make in the manufacture of computer pumps. In giving such consent the Board of Directors of defendant Tokheim passed a resolution on or about November 10, 1934 stating " 'That we consent to a licensing arrangement to other companies only under terms that will admit of price control * * * .' " This resolution was passed after C. M. Niezer, Chairman of the Board of Directors, had "brought to the attention of the Board the rather delicate status of the Computer situation, with reference, particularly, to doubtful claims in the Wayne Company patent," under which Tokheim was licensed.

The defendant Wayne, with the consent of G & B and Tokheim, on or about January 2, 1935 issued a license under the Jauch patent to John Wood Manufacturing Company, Inc., a gasoline pump manufacturer using computing mechanisms of its own make in the manufacture of computer pumps, which was substantially similar to other licenses issued at approximately the same time to gasoline pump manufacturers purchasing Neptune computing mechanisms, and contained the following terms and conditions, among others: that the licensee acknowledge the validity of the Jauch patent; that all patents on computing mechanisms and computer pumps and improvements thereon owned or controlled by the licensee be subject to uses determined by the defendant Wayne; that the licensee refrain from using computing mechanisms to convert non-computer pumps into computer pumps and from selling computing mechanisms for such purpose; that the licensee purchase computing mechanisms only from Veeder unless an exception was allowed by Wayne; that the licensee adhere to the prices, discounts, commissions, terms, and conditions for the sale of computer pumps determined by Wayne; that Wayne have the right to enforce adherence to the aforesaid terms and conditions by imposing liquidated damages or by cancellation of the license or both and by withdrawing from the licensee permission to purchase computing mechanisms from Veeder; that the licensee make certain royalty payments to Wayne.

Prior to the grant of such license the United States Patent Office had declared a patent on computing mechanisms controlled by John Wood Manufacturing Company, Inc. to be in interference with the Jauch patent. Wayne, as a condition to the grant of a license to the John Wood company, required such licensee to cause to be filed in the United States Patent Office a concession of priority to the Jauch patent, which concession was filed in said Office in January 1935.

In or about June 1935 the defendant Wayne, with the consent of G & B and Tokheim, offered Neptune a license under the terms of which Neptune would acknowledge the validity of the Jauch patent, refrain from selling computing mechanisms to other companies except with the permission of Wayne, G & B, and Tokheim, and would permit all patents on computing mechanisms and computer pumps and improvements thereon, then owned or controlled or thereafter owned or controlled by Neptune, to be subject to uses determined by the defendant Wayne. Neptune refused such license. Wayne in or about June 1935 offered to sell the Jauch and other patents on computing mechanisms and computer pumps owned or controlled by Wayne to Neptune on condition that Neptune would thereafter administer the licenses already issued under the Jauch patent on terms and conditions, including price control, established by the defendant Wayne. Such offer was refused by Neptune. During 1935 the defendant Wayne, with the approval of G & B and Tokheim, instituted infringement proceedings against a user of a computer pump embodying a Neptune computing mechanism. Such suit was defended by Neptune. Wayne and Neptune during 1937 entered into a settlement of such suit, which settlement contained the following terms and conditions, among others: that Neptune acknowledge the validity of the Jauch patent in perpetuity; that all patents on computing mechanisms and computer pumps owned or controlled and thereafter acquired by Neptune be subject to uses determined by Wayne; that Neptune refrain from manufacturing computing mechanisms except with the approval of Wayne; that Neptune sell no computing mechanisms except to customers approved by Wayne, G & B, and Tokheim; that Neptune require a licensee of Wayne whose stock was controlled by Neptune to accept a substitute license under the terms of which said licensee would acknowledge the validity of the Jauch patent in perpetuity, would permit Wayne to fix or eliminate discounts to jobbers and would permit Wayne to cancel said license in the event of specified changes in the ownership of said licensee. The substitute license agreement required of such licensee was executed during 1937. Since the execution of the aforesaid agreement between Wayne and Neptune the defendant Wayne has refused to license other gasoline pump manufacturers under the Jauch patent and the defendant Veeder has refused to supply computing mechanisms to any gasoline pump manufacturer except Wayne, G & B, Tokheim, and Wayne's other licensees.

During 1938 Wayne conducted an audit of the books of its licensees, threatened licensees other than G & B and Tokheim with the imposition of liquidated damages and with cancellation of their licenses for alleged violations thereof, and demanded that the licensees other than G & B and Tokheim enter into new license agreements. With the exception of Martin & Schwartz, Inc., such licensees other than G & B and Tokheim during 1938 entered into substantially similar substitute license agreements with defendant Wayne under the Jauch patent. These substituted licenses in addition to many of the clauses contained in the previous agreements contained clauses providing that the licensee acknowledge the validity of the Jauch patent in perpetuity, that the licensee grant to Wayne the right to fix or eliminate discounts to jobbers, that the licensee grant to Wayne the right to cancel the license in the event of specified changes in the ownership or management of the licensee, and that improvements on computer pumps developed by the licensee which might be required by State Sealers or Fire Underwriters, not be submitted to such State Sealers or Fire Underwriters except by Wayne's express approval.

In or about June 1938 Wayne issued regulations to its licensees eliminating discounts to jobbers.

The defendant Wayne through regulations issued to its licensees, has established from time to time the following maximum commissions payable to salesmen of computer pumps:

January 3, 1935	25%
August 1, 1935	22½%
January 1, 1937	17½%
January 1, 1939	15%
January 1, 1941	10%

During 1939 the defendant Wayne cancelled the license agreement of the smallest of its licensees and Veeder thereafter refused to sell computing mechanisms to such licensee without specific authorization from Wayne.

Results of Alleged Conspiracy Cited

[29] The combination and conspiracy hereinbefore described was intended to have and did have the following effects, among others: the defendants have from time to time reduced the commissions paid to salesmen of computer pumps, thereby reducing the income of such salesmen; have eliminated discounts to jobbers, thereby eliminating such jobbers from the business of buying and selling computer pumps; have prevented and controlled changes in the management and ownership of Wayne's gasoline pump manufacturer licensees other than defendants G & B and Tokheim; have eliminated from the gasoline pump manufacturing field many manufacturers of gasoline pumps; have prevented the use of computing mechanisms to modernize non-computer pumps; have secured control of all manufacturing sources of computing mechanisms in the United States; have secured ownership or control of all patents pertaining to computing mechanisms and computer pumps; have restricted the manufacture of computing mechanisms to the defendant Veeder; have restricted the manufacture of computer pumps to the defendant Wayne and its gasoline pump manufacturer licensees; have restricted the purchase of computing mechanisms for use in manufacturing computer pumps to Wayne and its licensees; have prevented the institution and continuation of litigation threatening the validity of the Jauch patent; have suppressed competition in the development, acquisition, and use of inventions and patents relating to computing mechanisms and computer pumps; have fixed arbitrary, artificial, and non-competitive prices for the sale of computer pumps; and have in these and other ways restrained interstate trade and commerce in computer pumps.

THE EDITOR'S PAGE

Readers Comments and Opinions will be much Appreciated by—WARREN C. PLATT, Editor and Publisher, Penton Building, Cleveland, O.

Educating the Oil Jobber

This is the time of year when oil jobbers go to school.

Once upon a time during the winter season the jobbers did not attend "schools" but "conventions" which consisted of a speech of "welcome" by the mayor or his secretary or some other understudy, windy talks and generally some dull "papers", an "annual election" and much jamboreeing.

But now these conventions are getting more educational on business subjects every year. This year's programs are filled with talks by men who know subjects immediately pertaining to the jobbers' problems, such as selling, taxes, wage-hour law interpretations, octane requirements and, by a state technical expert, why crank case oil should be changed every 1,000 miles. These are fair samples of what the jobbers "study" at these meetings.

The jobber's place in the oil industry is shown by the fact that he distributes some 42% of the gasoline, for example, that is sold through service stations. Most of this is major company national brand gasoline while the balance is so-called "unbranded" gasoline. But whatever the brand, the MANAGEMENT of the selling and distributing operation is the job of the jobber. Business has long since learned that selling calls for the most careful management in order to be at all efficient, and business also has learned that the nearer REAL MANAGEMENT is to the point of sale, the more effective that management will be.

But MANAGEMENT, just like the sales and delivery forces, needs constant education. There are new ideas and new methods every day in selling MANAGEMENT. A MANAGER'S mind must be in a constant state of development if he would keep abreast of his competition. One of the best places for Marketing Management, as represented by the oil jobber, to get this necessary education is in the meetings of his own state association. There the subjects can be discussed as they pertain to his local state problem. There he can ask questions that will further illuminate the discussions.

NPN has a record this winter of ten state associations that are meeting in these educational sessions. In January there were two, the Northwestern and Oklahoma jobbers; in February there will be 5, the jobbers of Tennessee, Wisconsin, Kentucky, Illinois and Iowa; in March 2 state associations, Indiana and Ohio, and Virginia in May. In addition, the Dixie jobbers hold their national meeting in March.

So far, the largest attendance in history is being reported for these meetings. May they all be equally well attended and, from what we have seen of advance copies of their programs, they will certainly be more educational than ever before.

It is such programs as these that insure the continued importance and permanence of the oil jobber in the oil industry.

Predicts Railroads May Beat Pipe Line Costs

The railroads seem to be rapidly approaching a conception of an entirely new freight rate structure that, if once reached and put into effect, should rather revolutionize the oil industry.

For instance, last week the Illinois Central asked permission of the I.C.C. to cut its coal rate from southern Illinois mines to Chicago from $1.75 to $1.30 a net ton or 25% less, when shipped in 50 car trains. The new rate is supposed to be so competitive with a rail-barge haul as to insure the railroad getting more than 1,000,000 tons a year of additional coal freight from one large consumer in Chicago alone, whose million tons has been moving mostly by barge.

If the I.C.C. grants this reduction on coal, it will not only have to grant any requests from railroads for similar reductions for train load business in oil but, the I.C.C. will find the logic of its own acts and that of a few railroads so compelling as undoubtedly to force the Commission to order all railroads to put in train load oil rates as well as train load rates on other commodities, whether all roads want the lower oil rates or not.

As further showing the trend of thought on completely new rate structures, is another recent editorial comment of Sam O. Dunn, editor of the dominant railroad paper RAILWAY AGE. We have quoted Mr. Dunn before to show how his editorial thinking is undertaking to lead the railroads to another conception of rate structure. In this editorial, Mr. Dunn was enumerating the "inherent advantages" of three types of transportation, railroads, motor vehicles and water carriers. But in a footnote, he states the most striking idea of all, as pertaining to oil, for he says,—

> "Pipe lines are omitted from this brief statement of inherent advantages of the several transportation agencies, because it is not self-evident that pipelines have any. That is to say, if oil were offered to the railroads in the dependable quantities in which it is secured by pipe lines, is it not possible that, by improvements in organization and equipment for trainload (rather than carload) handling, the railroads might at least duplicate the efficiency of the pipe lines?
>
> "Also omitted from the above summary are barge lines operating on improved inland waterways. None of the advantages enjoyed by these agencies is natural and inherent, but solely arbitrary and artificial. If users of these waterways had to contribute to the capital and maintenance and ad valorem tax costs of such facilities as users of railways have to contribute to such costs, the lack of any inherent advantages by inland waterway transportation would be quite clear.
>
> "It is perhaps worth nothing also that the railroads—because they combine two units, the carload and the trainload, whereas ships deal only in large quantities and trucks only with small quantities—form an intermediate agency between the other two, offering some of the advantages of each."

NPN submits that the continued preaching of such doctrine by such an excellent authority as the editor of the RAILWAY AGE, a man of more than 40 years standing with the railroad industry, is bound to have a material effect on the thinking of the railroad men.

Then look, for illustration at the great change which at last the railroads are making in their passenger service and rates, the best of fast and comfortable service at a new low level of rates. These new streamlined trains, whose cars are built on the same engineering principles as today's easy riding automobiles, are certainly getting the business. Incidentally, most of them are drawn by Diesel-type engines which are also being ordered now for fast freight service.

If the railroads at last adopt this type of thinking and explore intelligently and aggressively the possibilities of adding vastly greater oil tonnage to their rails by much lower rates, it is entirely possible that the much talked of advantages of the pipelines will fade, at least considerably. Pipelines were advantageous only, first, because the railroads in the early days of oil were exceeding crude and inefficient,—and, second, because in later years the railroads refused to see the possibilities of water and trucks as competitors, and also, probably, because of some weird quirk of railroad men's "thinking" that they did not want to "offend" their "largest oil shippers" who were as rapidly as possible expanding competing means of competition and taking an ever increasing amount of oil tonnage off the rails.

In two periods in recent years, pipelines have been unable to meet competition. Back ten and more years ago with the great development of Gulf Coast fields and the improvement in tankers, the cross-country pipelines were without business from the Mid-Continent fields because even Oklahoma oil could be shipped to the Gulf and tankered to the northern Atlantic Coast cheaper than pumping it across the Middle West by pipeline. These cross country trunk lines, several of them common carriers at law and in fact and absolutely dependent on their shipping business to live as their stock is owned by the general public and not by any oil companies, were just about closed down for lack of business.

Then today some of these lines do not seem to be doing so well. Counsel for the Great Lakes Pipe Line, that co-operative gasoline line built only a few years ago by a group of Mid-Continent refiners to save themselves from high rail

rates, stated at an I.C.C. hearing the other week, that the Great Lakes shipments are now off 75%. Presumably this is because of the Illinois field, other means of transportation, and products entering from other parts of the country, taking the business of the owners of this line. A pipeline operating at any such low efficiency cannot hope to get along.

If Editor Dunn's vision proves correct, that by better equipment, and better management by the railroads and with the guarantee of large dependable quantities of oil for given shipment, the rails can afford not only to meet pipeline and barge costs, but even show them up, this oil industry is certainly in for a considerable revolution. The small refiner in the field will come back in the picture instead of being held mostly to 100 or 200 miles of the field as today. Widening this refiner's marketing scope will mean far more supplies available to the local or unbranded jobber, who for the last few years has not only been increasing in number but particularly increasing in his percentage of the gallons at a faster rate than the nationally advertised brands. The growth of any such competition may put an entirely different complexion to the oil industry than it now has.

Any such drastic reductions in rail rates on oil will undoubtedly be applied to all other commodities and this will necessarily change the truck hauling picture. Probably there will be less long distance hauling but a greater refinement of local hauls and hauls breakingup solid train loads that may move on the new rates.

However, with the tremendous increase in demand for transportation, due to our rapidly growing war defense needs, there will be room for all the existing transport facilities for some years. But when this rush period is over, then undoubtedly we will see who is the most efficient and it may be well not to bet too much money on the pipelines or water transportation for what could not a railroad do to its costs if it decided to get the tonnage necessary to operate at say 90 or 95% of its capacity ALL the time? You know how low marketing costs are the nearer you can operate at 95% of 24-hour capacity?

OIL TAX NEWS

Texas' Chain Store Tax Drive Launched Against All Majors

Special to N. P. N.

AUSTIN, Feb. 1.—Bulwarked by a Texas Supreme Court decision and four months in which to gather figures, the Attorney General's department last week launched what is believed to be a determined drive to make every major oil company in the state pay the Texas pyramiding chain store tax.

In presenting the Texas Co. with a bill for $244,893 in taxes allegedly owed for the single year of 1936, Atty. Gen. Gerald Mann intimated that similar action will follow without delay against every oil company that has had dealer stations in the State since the chain store tax law went into effect.

Mr. Mann informed the state controller's department that, in the opinion of his office, The Texas Co. owed that amount in taxes and that he would enter suit to collect it if the money was not paid.

Standard Pays Chain Tax

On last Oct. 3, Texas Supreme court ruled that Standard Oil Co. of Texas must pay the chain store tax on 20 filling stations in west Texas by refusing to grant the oil company a review on a previous lower court ruling. Standard declined to appeal the case to the federal courts and paid the tax.

Standard was the first oil company to lose its fight against the tax, but a suit is pending against Humble Oil & Refining Co. for approximately $750,000 allegedly owed the state for taxes over a 4-year period.

Drafters of the state's chain store tax law apparently intended to exempt filling stations, but the courts held that they are included under the wording of the law. The controversial section of the chain store tax law reads as follows:

"Chain store classification shall not include . . . oil and gas well supplies and equipment dealers . . . or any place of business engaged EXCLUSIVELY in the storing, selling, or distributing of petroleum products or servicing of motor vehicles."

Court ruling held that dealer stations and all other stations over which a parent company exercises control of price or management must pay the tax, if those stations sell anything except gasoline or oil. The ruling held that servicing of motor vehicles included washing, greasing and servicing with water and air but does not include installing accessories (tires, batteries, spark plugs, fan belts, etc.) if the station sold those accessories.

The chain store tax runs from $1 per year for one store up to $750 annually per unit, if over 50 stores are under the same management.

Members of the state attorney general's department said the state will attempt to prove that nearly every major oil company controls the retail outlets selling its products, and that the state will lump all stations under the same management and thereby be able to collect a much larger tax per station.

Although the law provides a stiff penalty fine for failure to pay the tax, the state indicated that it will not seek to collect this penalty in its oil company suits. The penalty is that each store upon being found guilty of avoiding the tax shall be required to pay not less than $25 per day and not more than $100 per day for each day's violation.

Illinois Crude Tax Called 'Too Drastic'

N. P. N. News Bureau

CHICAGO, Feb. 1.—"Too drastic as it now stands," is the comment made this week by the Illinois-Indiana Petroleum Assn. on the 5c per bbl. crude tax introduced by Rep. Paul Powell in Illinois House of Representatives. If passed, this bill would affect every barrel of crude produced in Illinois.

Many operators in the old fields in Illinois have very small production, averaging ½-bbl. per day, an I. I. P. A. official said, and any tax of 5c per bbl. would be an undue burden to these small producers.

It is also understood, from authoritative quarters, a conservation bill will be introduced shortly in the House, and unquestionably a tax will be suggested to cover the cost of administering the bill.

Expansion Program Announced by Ethyl

CLEVELAND, Feb. 4.—Ethyl Gasoline Corp. this week announced expansion of its supervisory staff throughout the United States to "expedite both technical service and sales promotional activities of the corporation in serving companies in the petroleum, automotive, bus, tractor, truck and accessory fields." Announcement was made by J. Coard Taylor, vice-pres.

Eastern Regional manager will be John G. Martin, former national director of Ethyl motor clinic system, while Western Regional manager is Richard C. Murphy, former manager of Ethyl's New York division.

Both these men will aid General Sales Manager Harry W. Kaley in directing Ethyl's 10 division offices as well as administering the enlarged program of co-operative service with oil and automotive companies which the corporation will undertake in 1941.

T. C. Watkins, III, Dies

Tucker C. Watkins, III, South Boston, Va., 29, died Jan. 26 from injuries received in an automobile accident on the same day. He was the son of Tucker C. Watkins, Jr., president of United States Oil Co., South Boston, for whom he worked.

He leaves his wife, Mrs. Lillian Watkins, his mother and father, a brother, Dr. William R. Watkins, South Boston, and a sister, Mrs. Henry McLaughlin.

On sentry duty

The Chemical Sergeant is enlisting for national defense and he is a valuable recruit The Chemical Sergeant is U. O. P. Inhibitor No. 4

Tried and proved in millions of barrels of cracked gasoline, he's in the army now—safeguarding the motor gasoline and super-octane aviation fuel stored for national defense —keeping the gum all out and the anti-knock value all in

And the sergeant won't have to give up his civilian jobs either—he can take care of it all

You don't have to be a Universal licensee to enlist the Chemical Sergeant in your service, but you ought to be because all the processes needed to make new petroleum products for national defense are available to you through Universal

And Dubbscracking

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

NPN's Log

On Oil Legislation

Oil legislative information, summarized below, is based on reports deemed reliable although NATIONAL PETROLEUM NEWS assumes no responsibility for the accuracy or completeness of this information.

STATE BILLS

Arizona

S-88, Fain
Appropriates $50,000 to purchase logs and strata samples of first 4 oil wells completed to 4000 feet in Arizona.

Arkansas

H-165, Budget Committee
Makes appropriations for operation of oil and gas commission for biennial ending June 30, 1943.

California

A-2482, Potter
Same as A-2483 and A-2484. Regulates sale and distribution of gasoline and other motor fuels. To Revenue Committee.

S-677, Keating
Prohibits use of state highways to deliver fuel to vehicles thereon. To Transportation Committee.

A-1238, Hawkins
Requires labeling of retread or regrooved tires. To Motor Vehicles Committee.

A-1812, Heisinger
Same as A-1813, A-1814, A-1815 and A-1816. Increases gasoline tax to 3.5c per gal.; reduces auto registration fee to $2.

A-1850, Gaffney
Compulsory auto liability insurance. To Insurance Committee.

Connecticut

H-67, Bradley
Exempts motor vehicles from motor vehicle personal property tax. To Finance Committee.

H-124, Bradley
Repeals automobile inspection. To Motor Vehicles Committee.

H-412, Clarie.
Excise tax on sale or use of motor fuel and regulates storage and sale of motor oils, liquid fuels and lubricating oils. To Finance Committee.

S-222, Scranton.
Prohibits registration of commercial vehicles transporting inflammables unless it complies with regulation of motor vehicle commissioner. To Motor Vehicles Committee.

Delaware

H-16, Richards
Limits gross weight of trailers and load to 22,000 lbs.

Georgia

SR-18, Couch
Resolution alleging irregularity in the purchase of gasoline by the state Highway Board.

H-218, Easler
Changes motor vehicle registration date to March 1. To Motor Vehicles Committee.

Idaho

H-95, Morgan et al.
Exempts municipalities from motor fuels tax.

H-86, Preston.
Requires ½c per gal. fee for annual inspection of vehicle fuel tanks.

Illinois

H.101, Powell.
Taxes crude production 5c per bbl. For old age assistance.

H-102, Powell.
Imposes 5c per bbl. tax on oil imported into the state after Sept. 1, 1941. Proceeds earmarked for old age assistance.

H-9, Crowley
Extends sales tax at 2% until July 1, 1943. To Revenue Committee.

Indiana

H-221, Copeland, et al
Limits height of motor vehicles used on highways to 13½ feet; limits its length to 36 feet, and combined length to 60 feet. To Roads Committee.

H-270, Beasley
Repeals truck tire weight tax. (Emergency). To Roads Committee.

Iowa

H-132, Dvorak
Requires sand boxes on all semi-trailers. To Motor Vehicles and Transportation Committee.

Maine

H-651, Weston
Provides period April to November for inspection of motor vehicles. To Motor Vehicles Committee.

H-9, Harris, et al
Processing tax of 1c per gal. on gasoline. To Revenue and Taxation Committee.

S-179, Friend
Constitutional amendment prohibiting diversion of motor vehicle tax funds. To Ways and Bridges Committee.

Maryland

H-189, Cordish
Repeals exemption of service stations from chain store tax. To Judiciary Committee.

Michigan

H-111, Hooper.
Reduces gasoline tax from 3 to 2½c per gal. To General Taxation Committee.

Minnesota

S-188, Masek
Prohibits trading stamps, coupons, etc., except on payment of $6000 license per county. To Public Welfare Committee.

H-247, Peterson, P. J. E.
Memorializes congress to repeal the 2c per gal. excise tax on fuel oil. To Motor Vehicles and Motor Tax Laws Committee.

S-268, Wing et al
Raises gasoline tax to 5c per gal. To Motor Vehicles and Motor Tax Laws Committee.

New Mexico

S-32, Smith
Provides for extension of Interstate Oil Compact Commission. To Natural Resources Committee.

S-37, Mullis.
Exempts municipal airports from tax on gasoline used for aviation. To Judiciary Committee.

New York

A-490, Giordano.
Requires shut-off valve or other device to prevent overflow on fuel oil storage tanks of 275,000 gals. and hereafter tanks installed for heating water in dwellings. To Cities Committee.

A-399, Budget Bill
Same as S-362. Continues emergency taxes, including two 1c per gal. taxes on motor fuels. To Ways and Means Committee.

North Carolina

H-82, Uzzell, et al
Restricts transportation of gasoline, kerosine and other motor fuels by motor vehicle on public highways. To Public Roads Committee.

H-108, Stone.
Exempts from tax all motor fuel lost through lightning, flood or windstorm, where loss is suffered by distributors who elected to pay tax on motor fuel purchased, produced, etc., in lieu of amout sold, distributed, or used. To Public Roads Committee.

North Dakota

H-97, Aker and Welder
Changes from 50c to 25c the cost of tax exempt purchase license, and changes bulk station license from $2 to $5. To Taxes Committee.

H-102, Levin
Establishes a state industrial alcohol plant and appropriates $25,000. To Agriculture Committee.

H-82, Austad.
Provides for a minimum knock rating on tractor fuel. To State Affairs Committee.

Ohio

S-71, Gray
Extends liquid fuel excise tax for 2 years to March 31, 1943.

H-117, Gardner
Provides for use of local tax revenues for lighting roads.

H-152, Easton
Creates a natural resources coordinating board.

Oregon

H-54, Semon, et al
Increases total truck weight from 4000 to 4500 lbs.

H-93, Duncan and McKay
Levies 1 to 10 mill tax on all taxable property for road fund.

H-196, Morse, et al
Increases weight of trucks in certain instances from 4000 to 6000 lbs.

Pennsylvania

H-122, Hirsch
Imposes emergency tax of 3c per gal. on fuel oil; provides for licensing and bonding of distributors.

South Dakota

S-77, Grisby
Provides for a 2% gross sales tax.

H-132, Swenning
Provides for reciprocity agreements with other states, waiving motor carrier fees.

Tennessee

S-276, Hickerson
Same as H-347. Carriers of petroleum products to report deliveries daily to Commissioner of Finance.

Texas

S-35, Brownlee
Exempt persons carrying own goods from provisions of Contract Carriers Act.

H-131, Cleveland
Gross receipts tax on wholesale and retail merchants, and levies severance tax on production of oil, natural gas and sulfur. To Revenue and Taxation Committee.

H-126, McCann
Levies 1c per gal. tax on combustible condensates, including gasoline and naphtha. To Revenue Committee.

H-48, Sharp
Monthly occupational tax on the oil industry. To Revenue and Taxation Committee.

H-179, McNamara, et al
Proration of wet gas and distillate or condensate wells by Railroad Commission in same manner now provided for oil wells. To Oil, Gas and Mining Committee.

H-104, Lucas, et al
Requires that retailers post octane number of gasoline on pumps or containers. To Criminal Juries Committee.

H-9, Harris et al
Processing tax of 1c per gal. on gasoline. To Revenue and Taxation Committee.

Utah

H-71, Jensen, et al
Prohibits carrying autos or other vehicles on double deck trucks.

Vermont

H-46, Haskell
Limits gross weight of trucks to 600 lbs. per inch of tire width; present limit is 15,000 lbs. per axle. To Highway Traffic Committee.

Washington

H-82, Needham
Graduated chain store tax on all persons operating one or more stores. To Revenue and Taxation Committee.

S-126, McDonald et al
Permits cities to impose an occupational tax on service station. To Judiciary Committee.

H-190, Smith
Declares selling and buying of gasoline is public utility. Provides for supervision, regulation and price fixing. To Public Utilities Committee.

H-200, Ryan et al
Graduated chain store tax ranging from $10 to $1000, based on number of stores in the U. S.

Wyoming

S-25, Mines Committee
Authorizes state to enter into an Interstate Compact.

S-41, Anderson
Exempts tractor fuel from gasoline tax.

* * *

Changed Status

Arkansas

H-55
Provides for issuance of highway refunding bonds to redeem highway obligations of the state. Approved.

Georgia

S-5, Redwine, et al
Same as H-7. Eliminates allowance of 1% of gasoline tax granted distributors for costs of collection. Passed Senate.

Idaho

H-18, State Affairs
Transfers collection of motor and aircraft fuel taxes from tax commissioner to commissioner of law enforcement. Passed House.

Indiana

S-57, Gonas
Prohibits extension of auto license deadline beyond legal date. Passed Senate.

Iowa

S-5, Dewey and Shaw.
Imposes prepaid retail sales tax of 2%. Passed House.

H-5, (Efficiency Committee)
Claims for motor fuel refunds must be filed within 3 months. Passed Senate.

Massachusetts

S-435, Francis
Prohibits delivery or transportation of fish, ice or fuel on Sundays. Hearing Feb. 4.

Montana

S-36, (Commission on Oils and Leases)
Grants oil and gas leases on state-owned lands. Passed Senate.

North Dakota

H-55, Educational Committee
Provides that 50% of net proceeds from sales of oil, natural gas or minerals found on state land shall be reserved for the state. Passed House.

H-41, Beingenheisner, et al
Increases size and weight of com-

mercial vehicles. Indefinitely postponed.

S-10, Cowden.
Authorizes extension of Interstate Oil Compact for 2 years. Passed Senate.

Oklahoma

H-4.
To revise excise tax on motor vehicles and place revenue therefrom in general fund. Passed House.

Oregon

S-37, Strayer.
Amends section relating to tax refunds on motor and aviation fuels. Passed Senate.

Tennessee

S-276, Hickerson. (Same as H-347)
Provides that carriers of petroleum products must report deliveries daily to commissioner of finance. Passed Senate.

S-57, Ragon, et al
Same as H-47. Repeals truck mileage tax. Passed Senate.

CONGRESS

Senate Bills

S-699, Truman, Mo.
Prohibits interstate operation of motor vehicles by unlicensed operators. To Interstate Commerce Committee.

SJ Res-32, Guffey, Pa. HJ Res-101, Boland, Pa.
Extends Bituminous Coal Act for 2 years. To Senate Interstate Commerce Committee, and House Ways and Means Committee.

HOUSE BILLS

HR-2788, Woodrum, Va.
Includes these appropriations: Resources Planning Board, $2,836,620 down $350,000; FTC, $2,360,000, up $60,000; Public Roads, $126,000,000, down $14,990,000; Maritime Commission, $160,190,000, down $24,500,000; Maritime Labor Board, no appropriation. Last year it was $175,000; Section 16, Elk Hills Naval Oil Reserve Litigation, $25,850, same. Reported to House.

HR-2819, Knutson, Minn.
Requires motor fuel to contain 10% alcohol from agricultural products under penalty of 10¢ per gal. tax. To Ways and Means Committee.

CHANGED STATUS

HJ Res-77.
Authorizes Maritime Commission to build 200 oil-burning cargo ships costing $350,000,000. Passed House and Senate.

Powerine Co. Denies FTC Lottery Charge

N. P. N. News Bureau

WASHINGTON, Feb. 4. — Powerine Co., Denver, has denied use of lottery methods in sale of "Powerine" and "Powerlube," in answer filed with Federal Trade Commission.

FTC charged Powerine had distributed booklets to dealers involving operation of a game of chance or lottery scheme in connection with purchase of its products.

FTC's press release says Powerine denies it "sells booklets, receipts, coupons or stamps for any price, and asserts that they are given to consuming purchasers of its products gratis, as a receipt for money spent for such merchandise, and that the benefits to the public derived from the presentation of the booklets, when filled with receipts, are simply variable prizes or gifts to such consumers for their patronage."

Legislative Oil Bills Mount With Tax Hikes in Major Role

N. P. N. News Bureau

NEW YORK, Feb. 3.—Proposals of increased taxes and regulatory measures on oil and its products were dropped into state legislative hoppers in greater numbers last week than at any time since the meeting of the lawmakers earlier this year.

Taxes on fuel oil, higher taxes on gasoline and severance taxes on crude were sought by bills introduced in many states.

A proposal to declare the gasoline business a public utility in Washington state has been introduced by Rep. Smith. Numbered H-190, the bill would declare the selling and buying of gasoline a public utility. It provides for supervision, regulation and price fixing of the industry. This proposal is no stranger to the Washington oil industry, having been introduced without success in other sessions of the state body.

North Dakota would establish a state industrial alcohol plant, and for that purpose appropriates $25,000. Proposal is contained in House Bill 102 by Rep. Levin. While the purpose of the bill is not known here, presumably it would be to promote the consumption of farm products of the state.

4c Fuel Oil Tax

Fuel oil would be taxed 4c per gal. under provisions of South Dakota H-146 introduced last week by Representative Anderson; 3c per gal. under Pennsylvania H-122, introduced by Representative Hirsch. Representative Hirsch's bill also provides for licensing and bonding of distributors. A Minnesota resolution, H-247, memorializes Congress to defeat the proposed 2c per gal. federal excise tax on fuel oil.

Increased state gasoline taxes are proposed in bills in California, Minnesota and Maine legislatures. California A-1812 asks a ½c per gal. increase in gasoline tax to 3½c; Maine H-9 would levy a 1c per gal. processing tax on gasoline. Minnesota S-268 would raise the state gasoline tax from 3 to 5c per gal. Texas H-126 proposes a 1c per gal. tax on "combustible condensates", including gasoline and naphtha.

'Gas' Tax Cuts Proposed

Reductions in state gasoline taxes have been proposed in South Dakota and Michigan. South Dakota S-103 calls for a cut from 6 to 3c per gal.; Michigan H-111 from 3 to 2½c per gal.

A Connecticut bill would impose an excise tax on the sale of motor fuel and regulate the storage and sale of motor oils, liquid fuels and lubricating oils.

Illinois Production Tax

Representative Powell of Illinois has introduced 2 bills to tax crude oil; one a production tax of 5c per bbl., the other an import tax of 5c per bbl., the proceeds from both to be earmarked for old age assistance. A Texas bill, H-131, also would levy a severance tax on crude production, and at the same time, levy a gross receipts tax on wholesale and retail merchants.

Station Classed as Chains

A proposal has been submitted in Maryland which seeks to repeal the exemption of service stations from the chain store tax, and a new, graduated chain store tax "on all persons operating one or more stores" has been proposed in Washington.

Texas' Representative Lucas, and others, have submitted a bill requiring that service stations post octane number of the gasoline offered for sale.

Idaho Prices Probed

Resolution introduced in Idaho legislature, calling for an investigation of gasoline price "fluctuations", has passed both houses and an investigating committee of 3 representatives and 3 senators has been appointed.

House members are: Wilford J. Taylor, Harold Koenig, and Henry O'Leary. Senate members are: W. E. Talboy, Scott Hall Grain, and D. I. Foreman. Committee will not have power of subpoena.

In the resolution, HCR-2, introduced by Rep. Taylor and other, it was contended that the price of motor fuel "appears" to be higher in Idaho, and that the price "varies" and "fluctuates greatly from time to time".

In Kansas, a bill to shelve Kansas' regulation of oil conservation power has been thrown into the state legislative hopper, but oil men and capital observers see little chance of it surviving beyond the committee stage.

Introduced by Rep. C. F. Jarvis of the south central Kansas district, the bill would deprive Kansas Corporation Commission of jurisdiction over the conservation and proration of Kansas' oil and gas resources. No substitute conservation statute or regulatory body are provided in Representative Jarvis' bill.

West Coast Suit Ends, Tide Water Dismissed

N. P. N. News Bureau

LOS ANGELES, Feb. 1. — Final chapter in the West Coast anti-trust case was closed here this week when Tide Water Associated Oil Co. was dismissed, at request of federal attorneys, by Judge Paul J. McCormick.

At same time, Seaside Oil Co. (described by the government as an affiliate of Tide Water) entered a plea of *nolo contendere* and was fined $4500. (For details of West Coast indictment, see NPN, Nov. 22, 1939 and Jan. 22, 1941).

All Charges Denied By Pump Companies

(*Continued from page* 13)

pump, such as we manufacture, is manufactured by us under a license from The Wayne Pump Company, owners of the patents granted covering the particular type of computer pump referred to. The United States Supreme Court has issued several decisions in the past upholding the right of the owners of patents to fix the minimum selling price of articles covered by such patents where such articles were manufactured under license by their competitors. The extending of licenses by The Wayne Pump Company to their competitors giving them the right to manufacture computer pumps under patents owned by The Wayne Pump Company was for the purpose of giving several gasoline pump manufacturers the privilege of manufacturing this type of pump, thereby creating a greater demand and use of the improvement, rather than creating a monopoly. The records will show that after The Wayne Pump Company licensed several other gasoline pump manufacturers to make computer pumps under their patents, that the sales by the Tokheim Oil Tank and Pump Company steadily declined each year due to the competition of the other manufacturers entering the field. Further, a study of the profits of all gasoline pump manufacturers making the computer pump will indicate clearly that the prices established did not result in even a normal profit, which indicates that the minimum prices established were not unduly high by virtue of having been established under a patent license.

Aviation 'Gas' Stocks Increase 66,000 Bbls.

Following is breakdown of aviation gasoline inventory by the A.P.I. in thousands of bbls.

	Jan. 25	Feb. 1
East Coast	813	769
Interior	714	728
Gulf Coast	3,024	3,006
California	1,457	1,566
Total Reported	6,008	6,069
U. S. Total (a)	6,233	6,299
U. S. Total, Year Ago (a)	3,659	3,676

(a) Estimated, Bureau of Mines basis.

WITH THE ASSOCIATIONS

FTC Orders Five Auto Groups To Stop Certain 'Agreements'

N. P. N. News Bureau

WASHINGTON, Feb. 4.—Federal Trade Commission has ordered five trade associations whose members are manufacturers and jobbers of a large percentage of the automobile parts and accessories sold in the United States, and their officers, directors, and agents, to cease and desist from carrying out agreements which prevent price competition and tend unreasonably to restrain trade in parts and accessories, Commission states in a press release.

Two of the associations, National Standard Parts Assn., Detroit, also known as N.S.P.A., and the Motor and Equipment Wholesalers Assn., Chicago, known as M.E.W.A., are national organizations. Other 3 are Mid-Western regional groups: Automotive Trades Assn. of Greater Kansas City, Kansas City, Mo.; Mississippi Valley Automotive Assn., formerly active in Iowa and Illinois, and Southwestern Automotive Jobbers Assn., whose members are in Missouri, Kansas, Arkansas and Oklahoma. Mississippi Valley and Southwestern associations are regional groups of the Motor and Equipment Wholesalers Assn.

Commission order directs N.S.P.A., composed of both manufacturers and jobbers, to discontinue attempting, by agreement with its members, the elimination of price competition among manufacturers and jobbers and the maintenance of retail prices suggested by manufacturer members. This association, together with the 3 jobber associations, namely, M.E.W.A., the Mississippi Valley, and the Southwestern, and also the Kansas City group consisting of both manufacturers and jobbers, are ordered to cease attempting to prevent establishment of new competitors of their members in the jobbing and wholesale fields.

Ehrlich Named Secretary Of Chicago Jobbers

CHICAGO, Feb. 1. — Sam Ehrlich, Chicago, president, National Gas & Oil Co., was named secretary of the Chicago Gasoline Jobbers Assn., announced Oscar L. Peterson, George C. Peterson Co., president, this week.

Koch on Lube Committee

NEW YORK, Jan. 30. — Through a typographical error in office of American Petroleum Institute's lubrication committee, the name of J. M. Koch, Quaker State Oil Refining Corp., Oil City, Pa., was not included in list of lubrication committee members for 1941 released by A.P.I. on Jan. 28 and published in NPN, Jan. 29, page 38.

A.P.I. Mid-Continent Group Plans Meeting March 21-22

NEW YORK, Feb. 3.—American Petroleum Institute's Mid-Continent District Production Division will hold its regular spring meeting March 21-22 at the Herring Hotel, Amarillo, Tex., according to announcement today. Following committee chairmen have been appointed to arrange details of the meeting:

Program, C. H. Keplinger, Shell Oil Co. Inc., Wichita; general arrangements, George Berlin, Skelly Oil Co., Pampa, Texas; registration, Herbert Goodpaster, Kerlyn Oil Co., Oklahoma City; entertainment, R. C. Kay, Amarillo, Tex.; and publicity, N. D. Bartlett, Amarillo Globe News, Amarillo.

Program of Wisconsin Petroleum Assn., Feb. 11-13, Schroeder Hotel, Milwaukee, will be found on page 38.

Brandon Will Head Louisiana Jobbers

NEW ORLEANS, Feb. 4.—Organized to promote good fellowship between suppliers, distributor and consumer of petroleum products, Louisiana Petroleum Marketers Assn. last week elected Ralph Brandon, Shreveport marketer, its first president.

Other officers of the new association include D. Thibaut, Donaldsville, vice-president; Richard Ayers, Alexandria, treasurer; and R. E. Elliott, New Orleans, secretary.

Directorate is composed of the above officers and Clayton Gilbeau, Opelousas; Frank Brown, Baton Rouge; G. Le Tard, Hammond; James Johnson, Lake Providence; and Frank B. Hayne, New Orleans.

Association headquarters will be at Baton Rouge. Temporary headquarters have been set up at New Orleans, P. O. Box 1493.

Oklahoma Oil Service Bureau Elects Officers

New officers of the Petroleum Service Bureau had a lot to say about putting the word "profit" in marketing at their recent annual meeting at Oklahoma City. Shown here in a between-session lull are: seated, left to right, Guy E. Wilkinson, Oklahoma City, secretary-treasurer in charge of sales for Sloane-Forsberg Oil Co., acting secretary; John Dryer, Oklahoma City, president, Dryer, Clark & Dryer Co., retiring president; E. H. Stubbeman, Norman, Van Pick Oil Co., vice-president. Standing, left to right: John Murphy, Hinton, Allen Oil Co., director; Don Davis, Oklahoma City, Phillips Petroleum Co.; Earl Vir Den, Red Rock, Red Rock Petroleum Co., director; and C. J. Hunter, Oklahoma City, manager P. S. B. New president and secretary will be named later

Secretary of API Committee Scores Alky-Fuel Proponent

N. P. N. News Bureau

CLEVELAND, Feb. 3.—"If alcohol from American farm products is available today for 15c per gallon, there are certainly a lot of people in the alcohol industry who would like to know about it," comments Arnold R. Daum, secretary of the Committee on Motor Fuels of the American Petroleum Institute, in a letter to NATIONAL PETROLEUM NEWS this week about statements made by Dr. William Jay Hale before the Cleveland Chapter of the American Banking Institute here Jan. 23 (See NPN Jan. 29, page 17).

"The average cost of producing alcohol commercially from 50c corn is about 31c per gal., the Department of Agriculture estimates, and about 18c, using 10c corn," Mr. Daum states.

His letter points out that Dr. Hale in 1935 promised the selling of anhydrous alcohol ethyl alcohol at 15c within 3 years. "Also, then, as now," the letter adds, "he was talking about a mysterious new process, known only to a few living men, by which this miracle was to be wrought."

Daum's Letter to NPN

Following is complete text of the motor fuels committee secretary's letter to NPN:

EDITOR:

According to NPN, Dr. Hale, power alcohol's leading advocate, told 300 Cleveland bankers and their guests recently that under a "new" process, power alcohol from farm products is being made for 15c per gal. "and don't think we can't improve this—why, we haven't even begun." Further, "that alcohol from farm products would be made for 5c per gal. within 15 or 20 years and 100-octane motor fuel from alcohol for 10c.

Maybe so. But let's see what Dr. Hale was saying 5 years ago, and to what extent those predictions have been fulfilled. In 1935 he told the Dearborn Conference of Agriculture, Industry, and Science: "We of the fermentation industries promise the selling price of anhydrous ethyl alcohol at 15c per gal. within 3 years at a good profit. Within 5 years we shall be selling at near 10c per gal." Also, then, as now, he was talking about a mysterious new process, known only to a few living men, by which this miracle was to be wrought.

Mr. Hale's ideas were put to test at a plant at Atchison, Kansas, with which he was closely identified and which was publicly announced as a venture to demonstrate the commercial feasibility of manufacture and sale of power alcohol. Selling price of the product to the motor fuel trade was 25c per gal., f.o.b. plant, farmers to be paid 50c per bushel for corn and an equivalent price for other raw materials used in alcohol manufacture.

The plant began production and sale to motor fuel trade October, 1936. In its slightly more than 2 years of operation, it succeeded in producing only a little over 600,000 gals. of alcohol, or only about 2 months' output at the plant's advertised capacity of 10,000 gals. daily. Data made public by the Department of Agriculture reveal that the plant never succeeded at making alcohol for anything like 25c per gal., say nothing of 15c, and that in its first year of operation it used 30 carloads of blackstrap molasses, enough to account for the entire output of alcohol. Getting 25c and not 15c for its product, the plant went out of business November, 1938, working capital exhausted and financially insolvent. Announcing his resignation, the president of the Atchison Agrol Co. commented that "the plant has never demonstrated that it could produce from grain a sufficiently low priced product. . . ."

If alcohol from American farm products is available today for 15c per gal., there are certainly a lot of people in the alcohol industry who would like to know about it. If Dr. Hale referred to alcohol made from imported blackstrap molasses, it is no news that sometimes, temporarily, when there is a surplus of distress blackstrap molasses on the market, such alcohol may sell that low. Exactly what good a market for 15c alcohol made from imported blackstrap molasses is going to do the American farmer remains to be explained.

While a few exceptionally efficient and fortunately situated plants might shade the cost slightly, the average cost of producing alcohol commercially from 50c corn is about 31c per gal., the Department of Agriculture estimates, and about 18c using 10c corn. Is it possible that Dr. Hale seriously expects farmers to supply alcohol plants corn for 10c per bushel, or that such plants could long stay in business on that basis?

Very truly yours,

Arnold R. Daum,
Secretary

Shicktanz Heads Peoria Fuel Research For Department of Agriculture Study

N. P. N. News Bureau

WASHINGTON, Jan. 31.—Sylvester T. Schicktanz has been named head of motor fuel research at the Department of Agriculture's new regional laboratory in Peoria, Ill., where he is now launching experiments intended to determine whether production of motor fuel from farm products is practical on a commercial scale.

Dr. Henry G. Knight, chief of Bureau of Agricultural Chemistry and Engineering, in announcing appointment of Mr. Schicktanz, said: "the work on motor fuels offers important possibilities for greatly increasing industrial utilization of farm products, including corn. Division charged with this work will investigate alcohol, and other products from fermented materials, which may be considered of possible use as fuels in internal combustion engines.

"Investigation also will deal with the development of liquid fuels—other than those produced by fermentation — and solids producible from farm crops as well as gaseous fuels derivable from crop residues such as cobs, hulls, straw and stalks."

A native of Belleville, Ill., and a graduate of the University of Illinois in chemistry and chemical engineering, Mr. Schicktanz, is new to the Agriculture Department, but had previously spent 12 years with the government, in research at the Bureau of Standards and with the Bureau of Internal Revenue alcohol tax unit.

Peoria motor fuel testing laboratory opened Dec. 16, but according to Dr. Knight, it will be another year before the experiments get into full swing. Plans call for 200 chemists and scientists working on the alky-gas problem at Peoria. Of these, about 100 are now on the job. Construction of the pilot plant, where the government will experiment with commercial production of motor fuel from farm products, is reported as well underway.

S. T. Schicktanz

Greases Classified, Beginning March 1

CLEVELAND, Feb. 1.—National Lubricating Grease Institute calls attention to fact that March 1 is final effective date on which becomes effective its classification of lubricating greases by A. S. T. M. worked consistency. At its annual convention in November, 1939, the N. L. G. I., after approximately 6 years' development work approved the classification. But the effective date was then set 18 months ahead, or March 1, 1941, to permit adjustment of stocks and packages.

Following is the lubricating grease classification, as copyrighted by the N. L. G. I.:

Grade	A.S.T.M. Worked Penetration
No. 0	355-385
No. 1	310-340
No. 2	265-295
No. 3	220-250
No. 4	175-205
No. 5	130-160
No. 6	85-115

Atlantic Refining Engineer To Speak February 7

NEW YORK, Feb. 1.—**Lester M. Goldsmith,** chief engineer of Atlantic Refining Co., will speak on "The Engineer and his Relation to his Company and its Suppliers," at a dinner meeting of the Philadelphia Chapter of the Elfun Society, Feb. 7.

PLEASE NOTE!

● Effective with this issue, the single copy price of NATIONAL PETROLEUM NEWS will be 15c per copy. This applies to all current issues, except special issues on which a higher price may be placed.

Copies of NPN over two months old will be 25c per copy.

To eliminate carrying numerous small accounts, NPN requests that all orders for 10 or less copies of any issue be accompanied by remittance.

NOTE: This does not affect in any way the regular yearly subscription rate of NPN —$3 in U. S. A.—$4.50 in Canada and Foreign countries.

National Petroleum News

All Major Crude Purchasers Buy on 100% Tables at 60°

N. P. N. News Bureau

TULSA, Feb. 3.—Virtually all buyers of Oklahoma and Kansas crudes on Feb. 1 discarded their 97, 98 and 99% tank tables and began buying oil on the 100% purchase basis.

The change in purchase basis will add an approximate 2% return to producers for oil sold, according to several operators. There are some, however, who contend that gains through use of 100% tank tables may be discounted almost entirely by correction of volume to 60° F.

Prior to Feb. 1, the general practice of buyers of Oklahoma and Kansas crudes was to make no adjustments in volume for temperature fluctuations, unless those fluctuations were artificially produced. Where temperature of oil did not approximate atmospheric conditions, some companies made an adjustment of 0.5% for each degree variance from atmospheric temperatures, and others made a 1% adjustment for each 20° variance.

Deduction for Actual B. S. & W.

The new basis provides for purchase of oil on 100% tank tables, correction of volume to 60° F. temperature and deductions only for actual content of bottom sediment and water.

Previously buyers had automatically discounted volume of oil in a tank for b. s. and w. content by 1 to 3%, using that volume as base in paying for oil bought.

Two methods of correcting volume to 60° F. are used by purchasers at present. Tendency at present is to base corrections on the Bureau of Standards' plan outlined in its publication C-410. This provides for a 1% deduction or addition to volume of oil for each 25° variance above or below 60° F., when oil is 15 to 34.9 gravity. In purchasing oils of 35 to 40 gravity, the factor used is 1% for each 20° change in temperature above or below 60° F.

Some companies, however, make use of the 1% basic figure for each 25° variance above or below 60° F. for all gravity oil.

Crude Buyers Listed

The list of buyers whose Oklahoma and Kansas crude purchases were changed Feb. 1 to the new basis include:

Continental Oil Co., Sinclair-Prairie Oil Marketing Co., Shell Oil Co., Inc., Bareco Oil Co., Standard Oil Co. of Indiana, Gulf Oil Corp., Phillips Petroleum Co., The Texas Company, and Pure Oil Co.

The following buyers have also announced adoption of the new purchase basis:

Skelly Oil Co., in Kansas; and Cushing Refining & Gasoline Co., Carter Oil Co., Magnolia Petroleum Co., Mid-Continent Petroleum Corp., Deep Rock Oil Corp., Tide Water Associated Oil Co., Cosco Oil Co. and Rock Island Refining Co., in Oklahoma.

Valvoline Hikes Prices For Penn Grade Crudes

BUTLER, Pa., Jan. 29.—Valvoline Pipe Lines announced a 15c a bbl. increase in prices it will pay for Penna grade crudes, effective Jan. 27, meeting similar advance made by other principal purchasing companies. (See N.P.N., Jan. 29, p. 11).

Valvoline's new prices are: Bradford (Elk & McKean counties, Pa.), $2.30 per bbl.; Warren, Forest, Venango, Clarion & Butler counties, Pa., $2.23; Allegheny, Beaver, Washington & Greene counties, Pa., $1.95; West Virginia, $1.89; South Eastern Ohio, $1.85.

New Jersey Fuel Prices Reduced .2c a Gal.

NEW YORK, Jan. 31.—Effective Jan. 28, Standard Oil Co. of New Jersey reduced its tank wagon price for No. 1 fuel oil 0.20c to 7.70c per gal. in the State of New Jersey, according to a company announcement.

At the same time, the tank wagon prices for Nos. 2 and 3 fuel oils were reduced 0.20c per gal. in northern New Jersey with no change in south Jersey, the announcement stated.

Kerosine Price Lowered 0.2c in New Jersey

NEW YORK, Jan. 30.—Effective Jan. 28, Standard Oil Co. of New Jersey reduced its "Esso" kerosine dealer tank wagon price 0.2c to 7.70c per gal. in New Jersey, according to company announcement.

Eastern Gasoline Prices Advanced By Socony

NEW YORK—Socony-Vacuum Oil Co., Inc., has announced that effective Feb. 5, its posted tank car prices for Mobilgas (regular) at its terminals throughout New York and New England will be increased from 0.2 to 0.3c per gal. Posted prices for tank wagon deliveries "will be increased accordingly", announcement said, adding, "although in some depressed areas dealer tank wagon prices will be adjusted in accordance with competitive conditions."

No change will be made in posted prices in greater New York, according to announcement.

Sohio Advances Carmi Crude

MT. VERNON, ILL., Feb. 3.—Sohio Corp., crude purchasing subsidiary of Standard Oil Co. of Ohio, has announced 5c increase to $1.10 per bbl., effective Feb. 1, in price it will pay for Carmi crude in the Storms, Ill., area.

Views on Prices in 10ths Sought in Kansas

WICHITA, Kans., Feb. 3.—Refining and marketing division of Kansas' oil industry will be surveyed for reaction to suggestions that industry fractions be expressed in terms of tenths or mills instead of eighths and sixteenths.

Survey will be conducted by a special committee appointed by the Petroleum Accountants Society of Kansas. Members of the Kansas accountants' group indicated favorable reaction to simplification of fractions and appointed the following committee to make the survey:

Mason Lyons, Wichita, Vickers Petroleum Co., chairman; George Peterschmidt, Eldorado, Kans., El Dorado Refining Co.; J. B. Ogletree, Wichita, Magnolia Petroleum Co.; L. M. Woodward, Wichita, Derby Refining Co.; and H. Karl Walker, Wichita, Globe Oil & Refining Co.

Oklahoma, Texas Order 60-Day Quota

N. P. N. News Bureau

TULSA, Feb. 3.—Oklahoma and Texas began operating Feb. 1 under 60-day proration orders.

The Oklahoma order pegs February and March production at 400,000 bbls. daily, an increase of 10,000 bbls. over the January allowable, but 42,500 bbls. under the Bureau of Mines' estimate of market demand for Oklahoma crude.

Texas order establishes a 1,318,873-bbl. allowable for February and March, with actual production expected to level out at around 46,000 bbls. below the Bureau of Mines' February demand forecast of 1,312,900 bbls.

Kansas' allowable production is expected to reach 196,200 bbls. daily during February, the highest since the fall of 1937 when the output of the state reached 200,000 bbls. February Kansas allowable is 2200 bbls. above January, and 3000 bbls. above the Bureau forecast.

Louisiana's 294,942-bbl. February allowable is up 10,000 bbls. from January, and 6342 bbls. above the Bureau demand estimate. Arkansas has not yet issued its February proration order.

NEW YORK, Feb. 3.—Revenue from taxes on the petroleum industry in Texas equal 54% of the state's total tax revenue.

Arkansas to Get First Recycling Plant Texas Now Has 34, Louisiana to Add One

N. P. N. News Bureau

TULSA, Feb. 3.—Arkansas will soon obtain its first repressuring plant, Texas its 34th recycling-repressuring plant and Louisiana will add another recycling plant to its list if plans now in various stages of completion materialize.

In the Schuler field, owners of 140 of the 146 wells producing from the Jones sand and 75% of the royalty owners involved have approved plans for unitizing the Jones sand wells for repressuring purposes. The Arkansas Oil & Gas Commission holds public hearings on the proposal later this week. At that time, operators in the field will advise the commission of plans to construct a $600,000 repressuring plant to maintain gas pressure. Processing capacity of the unit will be approximately 25,000,000 cu. ft. of gas daily. By-products of the repressuring plant will be incidental to repressuring, it was said.

Contracts for the plant are expected to be let in 30 to 40 days, although operators were uncertain when actual construction would begin.

Operators in the Hull-Silk field of North Texas are working on a unitization and pressure maintenance program to cover the field's 364 wells. Project is expected to cost approximately $525,000.

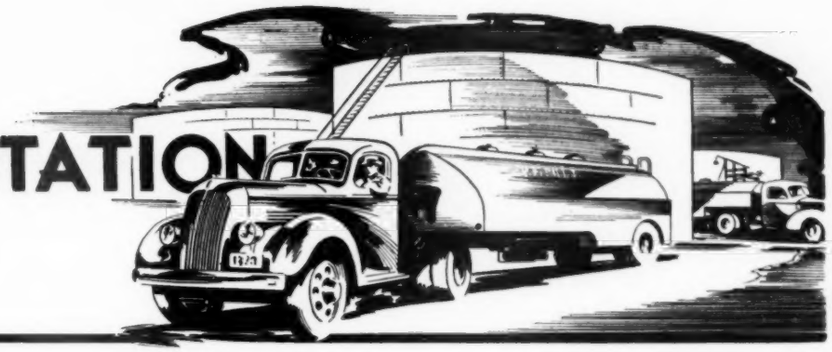
An enabling order has been issued by the Louisiana Conservation Commission to South Jennings, La., operators for construction of a recycling plant in that field. The unit would process 30,000,000 to 40,000,000 cu. ft. of gas daily.

High Court Reverses Oil Case Dismissals

N. P. N. News Bureau

WASHINGTON, Feb. 3.—Supreme Court has handed down an opinion holding that the filing of false and fraudulent reports under the Connally "hot oil" act on the amount of crude produced and received from producers, constitutes an offense under Section 35 of the criminal code as amended by the Act of June 18, 1934. (U. S. v. J. W. Gilliland, Ralph Gilliland, Fred A. Williams, et al)

OIL TRANSPORTATION



Highway Transportation Restrictions Proposed in Bills by State Lawmakers

N. P. N. News Bureau

CLEVELAND, Feb. 3.—Forty-two of the 43 state legislatures convening in regular session in 1941 are already underway, and once again highway transportation is one of the principal targets of the state lawmakers. Bills, among others, to require 2 men on gasoline trucks, to limit their capacity, restrict weight and height limitations and operations on the highways were introduced the closing week of January.

One of the most important bills from the oil industry's standpoint which has been dropped into the state legislative hoppers the past week, was the proposal of Rep. Burke of Ohio (H-193), which would require 2-man crews on vehicles carrying explosives, including 50 gals. or more of gasoline or kerosine.

Presumably, all trucks hauling gasoline and kerosine in the state would be affected, including commission agents, or peddlers, selling farm accounts.

Would Limit Truck Capacity

Four Minnesota state representatives have agreed on a bill to prohibit gasoline trucks from carrying more than 3000 gals. of fuel on the state's highways. In 1939, Minnesota's Governor Stassen vetoed a bill to limit the capacity of gasoline trucks to 2000 gals.

Identical bills in Tennessee, S-276 and H-347, would require carriers of petroleum products to report daily deliveries to the state commissioner of finance.

Deliveries of fish, ice and fuel would be banned from Massachusetts streets on Sunday by Senate Bill 435. Hearing is to be held on this bill Feb. 4.

Six bills, 3 in the House and 3 in the Senate, have been placed before Tennessee legislators to permit cities to tax trucks for the use of city streets, while an Iowa bill (H-132) comes up with a new proposal requiring semi-trailers to be equipped with sand boxes.

Weight and Size Limits

In South Dakota (H-141), the weight of trucks would be pegged at 8000 lbs. for one wheel; 16,000 lbs. for one axle, and 500 lbs. for each square inch of tire. A similar measure in Vermont, H-46, would limit the gross weight of trucks to 600 lbs. per sq. in. of tire width. Present Vermont limit is 15,000 lbs. per axle.

Bills Favor Trucking

Legislative proposals favoring highway transportation were among those introduced in some state legislature last week.

Two bills were offered in Oregon to increase the truck weight limit. One, H-196, seeks to increase the weight limit from 4000 to 6000 lbs. Another, H-54, would increase the weight maximum from 4000 to 4500 lbs. Delaware (H-16) would increase gross weight of trailers from 10,000 to 22,000 lbs.

Reciprocity agreements with other states is proposed for South Dakota by House Bill 132, introduced by Rep. Swenning.

Bills to repeal truck taxes were offered in 2 states. Indiana, H-270, by Rep. Beasley, seeks to repeal the state truck weight tax, while Senate and House bills (S-57 and H-47) to repeal Tennessee truck mileage tax have been introduced in the Volunteer state.

Rock Island To Build Refinery in Indiana

N. P. N. News Bureau

TULSA, Feb. 3.—The newly chartered Rock Island Refining Corp. has announced plans for construction of a complete 5000-bbl. refinery at Indianapolis, Ind.

The plant will have skimming, cracking and reforming units and would draw its crude supply from nearby Indiana-Illinois oil fields and from the Mid-Continent. The Mid-Continent oil would be shipped by pipeline via Illinois Pipe Line Co.'s trunk line, it was said.

The new company formed to operate the refinery is headed by L. B. Simmons, Duncan, Okla., president of Rock Island Refining Co., L. E. Winkler of Wichita, Winkler-Koch Engineering Co., and L. E. Kincannon, Duncan, Rock Island Refining Co., are vice presidents.

Output of the Indianapolis plant would be disposed of locally through independent jobbers, it was reported.

Cites Freight Rates

"We're again entering this area after having been nosed out by the freight rate situation," Mr. Kincannon told NATIONAL PETROLEUM NEWS.

The Rock Island Refining Co. operates a refinery at Duncan.

'Clean' Tanker Rates Down 23c in a Month

N. P. N. News Bureau

NEW YORK, Feb. 3.—A further drop in "clean" coastwise tanker rates was reported last week when a boat was fixed at 52c for gasoline, 54c for kerosine and 57c for No. 2 fuel. These rates, down another 2c per bbl., represent a total decrease over the past month of 23c per bbl. in the transportation cost of No. 2 fuel from the Gulf to Eastern Seaboard points, north of Hatteras.

Boat men attributed the drop in rates to a "lack of interest" on the part of charterers. Stocks are high, and fuel oil prices on the Atlantic Seaboard have recently been reduced, one boat man pointed out.

Meanwhile, "dirty" coastwise rates have remained virtually unchanged with little sign of weakening. Last paid for 30 gravity or lighter crude was 59c; for 10-19.9 gravity fuel, 66c.

Hearings To Be Held On West Coast Rate

N. P. N. News Bureau

LOS ANGELES, Feb. 3.—At hearings to be held by the California Railroad Commission at San Francisco, Feb. 6, evidence will be received on a proposed non-intermediate rate of 31c per 100 pounds on refined petroleum products in tank cars between San Francisco Bay and Los Angeles Basin points and the petition of the rail lines in this connection.

4 Tanker Contracts Let During January

N. P. N. News Bureau

NEW YORK, Feb. 3.—Contracts for the construction of 4 new tankers totaling approximately 42,600 gross tons were placed with American shipyards during January, 1941, according to American Bureau of Shipping.

Panama Transport Co., Standard Oil Co. (New Jersey) affiliate, contracted for 2 tankers of 9,800 and 10,000 gross tons, respectively, and Standard Oil Co. of California ordered 2 tankers of 11,400 gross tons each, Bureau said.

One tanker, the Esso Little Rock, was completed for Standard Oil Co. of New Jersey, and another tanker, the Atlantic Sun, was launched for Sun Oil Co. during January, according to the Bureau.

ICC Calendar On Oil Trucking

HEARINGS

A. J. Ballerstedt, Seymour, Tex (MC 101661) Feb. 13, Dallas, on application to operate as a common carrier of oil field equipment in the State of Texas, between Seymour, and points in Texas within 100 miles thereof, over irregular routes.

Tom Daugherty, Electra, Tex. (MC 101663) Feb. 14, Dallas, on application to operate as a common carrier of oil field equipment between points located in the State of Texas, over irregular routes.

Gerald Farr, Seymour, Tex. (MC 101662) Feb. 13, Dallas, on application for certificate to operate as a common carrier of oil field equipment in the State of Texas between Seymour and points located in Texas within 100 miles thereof, over irregular routes.

* * *

DECISIONS

Richard Kress and Robert Kress, doing business as Kress & Sons, Grand Rapids, Mich., (MC 100437, sub. 2). Application to operate as a contract carrier of petroleum products in bulk, in tank trucks, from Alma, Mich., to points in specified portions of Indiana and Ohio, over irregular routes, denied.

Stanley C. Budd, Vancouver, British Columbia, Canada, (MC 75721, sub. 1). Application to operate as a common carrier of petroleum and petroleum products in containers from Tacoma, Wash., to the international boundary of the United States and Canada over a specified route, denied.

Jobs in Defense Plants Lure Service Station Men in Ohio

(*Continued from page* 11)

ported instances of lessees turning back small-gallonage stations to the companies and moving into defense industry.

Station operators and marketers in the state also report that the occasional, part-time help, which could be called in from around the neighborhood to help pull a station over the Saturday afternoon rush, has been absorbed in the main by increased need for labor in industry.

Some of the larger companies have also been having difficulty in hiring men for employment at their training stations. They are paid the going wage for station employes during their training periods, and if they qualify are taken into the company as salesmen, or in other capacities. These companies report that the type of men they require is becoming scarce.

Pay Is Better

The average service station wage in Ohio, of course, varies with the area, the individual marketer, type of station, volume and other considerations, but average wages paid at stations are said to run considerably under those offered by manufacturers working on defense orders.

The union scale for station employes in Cleveland ranges between $91.25 and $111.25 a month, which is about the highest in the state, according to a representative of the union.

Many station operators, according to the union, pay less than the Cleveland scale. Reports elsewhere in the state place the employe wage at some independent stations at as low as $12 a week.

$20 to $30 a Week

Manufacturers working on defense orders are offering more attractive wages and shorter hours. Three large manufacturing companies in Cleveland working on defense orders pay unskilled workers between $20 and $30 a week.

These manufacturers have training programs, an added attraction to the young men now employed in service stations. They teach them a trade, and offer them an opportunity to increase their earning capacity. During their training period, the men are paid between $24 and $30 a week, by two companies. Similar programs have been adopted by other manufacturers because of shortage of skilled labor.

One company manufacturing airplane parts in Ceveland has increased its rolls from about 3000 to 4500 employes in the past 6 months, and it is seeking an additional 5000 to man a new plant it is erecting. The employment manager reports that some of its new employes have worked in service stations, but he said the number is not large.

Stations Take On Older Men

Because defense industry is taking up the slack in unemployment, oil companies report that they have not been able to obtain the type of men they desire to man their stations, and they have had to take older men.

Ohio Unemployment Bureau reports that one large oil company, which formerly asked for men between 22 and 28 years old, at least 5 ft. 8 in. tall, as well as having sales personality and a record for honesty, has now dropped its age and height requirement, and will accept men 35 years or older.

Employment manager of another oil company reports that it has become virtually impossible to obtain the type of service station employes they want, and that they have had to lower their standards somewhat. While this company had no hard and fast standards for station employes, the official stated that they preferred them to be in their 20's, preferably tall, and with good sales personality, as well as being honest. Now, however, they stress personality and honesty, and will take older men.

Low Volume Stations Hit Hardest

Another development which is causing oil marketers to view the problem with more than ordinary concern is its effect on the low volume and low income stations.

Unless operating a service station becomes more profitable, several marketers believe there undoubtedly will be many of the low volume stations forced out of business.

One marketer said these stations were never anything more than a means of some person keeping off relief, and that it would be a good thing for these uneconomic outlets to be closed up.

A personnel official of one large oil company reported several instances of lessees returning to work in private industry and turning back their stations to the company.

He cited, particularly, the case of a station operator, a skilled machinist, who for several years made a fairly good income from a station which he leased. Higher pay as a machinist, and shorter hours in this employment has resulted in the dealer selling his stock and turning the station back to the company.

Another personnel director reports that all division managers have been instructed not to attempt to hold lessees of the low-volume stations on the grounds of their owing loyalty to the company. "Let them find work in other industry," he told an NPN representative, "their first loyalty is to their families. We should not attempt to keep them if they can make more money elsewhere."

So far, the companies have been able to find other men to put in at these low-volume leased stations, although the replacements have been less qualified. One company said that some of the new station lessees were older men, with some money of their own, who had retired.

One smaller marketer reports that 4 of his employes have left to work in defense industry, and that his profit is such that he could not afford to compete with wages offered by the manufacturer.

Another marketer said that two of his employes walked into him and "laid their cards on the table." They pointed out that they would like to continue working for him but could make more money at shorter hours working for a certain manufacturing company. This marketer said he could not afford to pay them wages they could obtain in industry, and that the hours of employment at the station also was a contributing factor in the drift away from this work.

Still another marketer, commenting on the problem said, increased employment in defense industries would result in his being forced to take on older men. He added that it might also result in oil company stations taking on men with slight physical disabilities who would be capable of working in a station, but not able to get work in defense industries. Such men would also be exempt from the draft.

Virtually all Ohio marketers reached for comment agreed that higher operating costs at the station will result from increased employment in other industries and, later on, from the draft.

One marketer stated that now, more than ever, station operators will have to improve merchandising at stations to increase their revenues so as to meet competition for labor.

Others felt that the increased operating costs, likely to arise out of the defense program, will have to be met by higher costs to the consumer. All agreed that under present margins of profit most Ohio station operators and marketers cannot meet wage competition in areas where defense industries are seeking labor.

'Farm Out Work'

One company which maintains its own garages and hires mechanics said they were seriously considering the possibility of "farming" out their maintenance and repair work, and would probably do so if many of their mechanics drifted into defense industries, or were caught in the draft.

Speaking of ways and means of combatting the inroads that might be made by other industries on service station personnel, an Ohio state unemployment bureau official suggests the following program for oil marketers in their relations with station employes:

1—Offer men greater possibilities of advancement within the company.

2—Offer greater wage incentive, and periodical wage increase.

3—Promote better employe relations, and offer greater security.

This state official said that while he believes that service stations may suffer from increased hiring in defense industries, oil companies need not become completely competitive from a wage standpoint, but must follow an intelligent employe relations program to hold their men.

He cited the case of a manufacturing company in Cleveland which, he said, through a complete employe-relations program, had been able during the last war to hold all of its workers, despite the fact that they were being paid one-third less than employes of other companies in the same industry (not oil).

Except for keeping leased station operators happy, there isn't much that the supplying company can do to improve employe relations at dealer outlets. That is the responsibility for dealers themselves, both lessee and independent dealers.

But the dealers in Ohio are recognizing the problem. In one section of the state, one dealer association has held two meetings to discuss means of combatting the drift of their employes away from station work. The subject also may be taken up this week at a state-wide meeting of gasoline retailers.

BILLIONS FOR DEFENSE

Create New Oil Markets

Workers stream across bridge over traffic jam on road near $74,000,000 powder plant at Charlestown, Ind., one of defense "boom towns"

MORE than a billion dollars for new construction of defense plants has been allotted to date, covering 126 projects spread over 32 states. Jobs for several hundred thousand workers await the completion of these aircraft factories, powder and shell-loading plants, shipyards and other ordnance works.

Huge as this figure is, it does not include government arsenals, Army camps or other military works. Nor does it include the billions of dollars in defense contracts awarded to existing plants, nor the privately-financed expansion of these plants to take care of defense orders.

To oil marketers, this billion-dollar outlay by Uncle Sam for new construction is of interest because it is creating new consuming areas. "Boom towns" are springing up on mid-western prairies, in the Blue Ridge mountains of Virginia and Tennessee, on the Gulf Coast, on the West Coast and elsewhere. Many projects are out of reach of railroads.

If war comes to this country, these ammunition plants and other defense projects would be targets for enemy bombers. And that is why the government generally locates these projects on large tracts of lands, 'way back in the country.

Construction work on these projects is employing many thousands of workers—17,000 in one case. Without housing accommodations at the plant site, most of the men go to and from work in their own automobiles; some travel 50 miles or more a day. Later thousands of employes will come to work in the completed plants.

Even now, defense authorities are looking ahead to the day when permanent employes start pouring into these "boom towns". Part of their survey includes a study of service establishments (filling stations, garages, laundries, fuel distribution facilities, etc.). Will service facilities be adequate to handle needs of the newcomers and their families, especially in towns where populations heretofore have been numbered in the hundreds only?

Besides the construction projects, there have been thousands of factories starting up again all over the country to fill defense orders. Working 24 hours a day, many plants—even in good-sized cities—have recently exhausted the local supply of skilled labor and have had to draw on other areas. And again there has been a transportation problem.

Answer to the housing problem on construction jobs was automobile transportation from nearby cities. It provided immediate supply of labor without waiting to erect barracks. Similarly, the automobile is the solution to the skilled-labor problem in many areas.

Tempo of the whole defense program would have been much slower, as was pointed out recently by Thomas P. Henry, Detroit, president of the American Automobile Assn., had it not been for the widespread ownership of cars among American workmen.

Continuing, Mr. Henry said:

"An acute shortage of housing facilities and the lack of mass transportation to meet the labor requirements of old plants expanded and new plants constructed on purpose in isolated areas, created a serious problem which the passenger car alone could meet.

"It is not an overstatement to say that at the present time hundreds of thousands of skilled and unskilled workmen are motoring as much as 75 miles a day to and from factories of vital importance in the nation's production scheme, while thousands make a much longer trip."

Oil marketers face many new problems—and opportunities—in development of the defense program.

For example, there are proposals pending to build thousands of miles of access roads to defense plants. Over each of these roads daily will travel hundreds, if not thousands, of defense workers' cars. Undoubtedly, there will be a scramble to locate new service stations on such roads.

Again, will the 3-shift plan of operation mean that some local stations will stay open all night to catch the trade of workers going on and off duty?

Another question confronting marketers in these "boom town" areas is—will bulk plant and terminal facilities, built when the area was a farming community and gallonage thin, be adequate to handle the increased business? Ditto for trucks.

Classic example of a defense "boom town" is Charlestown, Ind., a village of about 950 population, dozing on banks of the Ohio River, 16 miles from Louis-

ville, Ky. Suddenly, there was thrust upon this town a $74,000,000 smokeless powder project, topped off a short while later with a $15,000,000 bag-loading plant. Seventeen thousand construction workers are now reported engaged on this project. Private homes took in all they could. Half dozen trailer camps sprang up. But still, most of these workers travel back and forth each day from Louisville or the larger Indiana towns nearby.

The powder plant, employing about 3000 munition workers, will furnish powder for the bag-loading plant (bagged explosives are used to propel the projectiles of large guns; smaller guns use shells loaded with powder).

Farther north in Indiana, at Union Center—a hamlet with only a handful of people—will be located a $11,500,000 shell-loading plant which will employ 6000 people. The plant site is 20 miles southeast of South Bend which means that either Union Center will mushroom into a town of 15,000—or more, or else the munitions workers will commute from surrounding area, with bulk of them living in South Bend.

Down in southwestern Virginia, below Roanoke, there are 2 similar powder projects. One, a $35,000,000 smokeless powder plant, is going up at Radford, while the other, is a bag-loading plant at Pulaski, costing $9.376,390. Both towns have populations around 7500. The Radford project will provide employment for 4500 munitions workers, the Pulaski plant, 2400.

Northern Ohio also has a powder plant and shell-loading project. Between Huron and Sandusky (east of Toledo), the government has purchased 7000 acres as site for a $39,388,330 plant to make T.N.T. for the shell-loading plant near Ravenna (southeast of Cleveland). Ravenna Ordnance Works, costing $14,215,000, is located on a 21,000-acre tract on Route 5, 9 miles out of Ravenna, a town of about 8500 population. Currently, there are 3500 workmen engaged on the construction job; about 5600 will be employed at shell-loading when the Ravenna works is completed.

Another twin-plant ammunition project is the Kankakee-Ellwood ordnance works in Illinois, southwest of Chicago between Joliet and Wilmington, Ill. The 2 plants will provide employment for about 7000 munition workers. Area of plant site covers a total of 40,000 acres.

WELDON Springs, Mo., with a population of around 100, is the site of another explosives plant, to cost $11,325,000. It is to be built on a 20,000-acre tract along the Missouri river, about 25 miles northwest of St. Louis, near St. Charles, Mo. First estimates are that the completed plant will provide 1200 jobs, but this probably is very conservative.

Lockland, O., a town of about 6000, a few miles north of Cincinnati, has a $42,488,548 aircraft engine plant being built on its outskirts by Wright Aeronautical Corp. No estimate is available as to number of employes.

Other areas are also slated for defense projects. For instance, the plan for manufacturing parts for bombers in the Detroit area and then shipping the parts elsewhere for assembling, includes assembly plants at Tulsa, Omaha, Fort Worth and Kansas City, Mo.

Defense authorities were quick to see that housing conditions threatened to delay many projects. C. F. Palmer, Atlanta, was appointed Defense Housing Co-ordinator. Recently, he reported that funds had been allocated for 49,706 family dwelling units, of which 29,462 were already contracted for. About half of these housing units are for civilian industrial workers, with the others for Army and Navy enlisted and civilian personnel.

Co-ordinator Palmer stated his policy, as follows:

"When we receive a report that defense activity threatens a housing shortage at some point, we immediately go into action.

"Our first question, of course, is how many of the new jobs will be filled by unemployed workers who already have dwellings in the neighborhood.

"Second, how many vacant houses are there available for incoming workers?

"Third, what transportation is available to bring workers as commuters from other communities?

"And fourth, how much private building is going on, and can it be stimulated to greater effort?

"As you see, our purpose is not just to build houses, but to find the quickest reasonable solution of the housing problem, whatever that may be.

"By this process we find that some cities, such for instance as Los Angeles and Indianapolis, can take the defense program in their stride with little or no government housing.

"Others, such as the Newport News, Va., area, must have several thousand houses, and already 6000 houses are under construction by private and public agencies in that locality."

Government housing projects will be only a part of home construction. Private capital, as always, will supply bulk of the dwellings.

"Little Heaven", one of the trailer camps at Charlestown, Indiana, ordnance project, housing a few of the thousands of construction workers. Most of workers commute by automoile from Louisville, Ky., and larger Indiana towns nearby

THIS surge in home building means more oil burners. So, the defense boom adds to the marketer's fuel oil customers, as well as bringing into his territory more automobile owners.

Meanwhile, defense industries are calling for more and more skilled workmen, and having to go miles to get them. Housing conditions around the plants are such that many employes live at a distance and travel several hours a day to and from work. A recent survey by the Automobile Manufacturers Assn. gives the facts on several instances of this kind.

At Bridgeport, Conn., armament plants draw workers from many miles around. Nearly 200 commute daily from homes within New York City to the Bridgeport plants, requiring 4 hours of automobile travel daily. A survey among new workers in Quincy, Mass., shipyards revealed more than 190 living 30 miles or more away, and 12 known to live 60 miles away.

Two thousand additional workers

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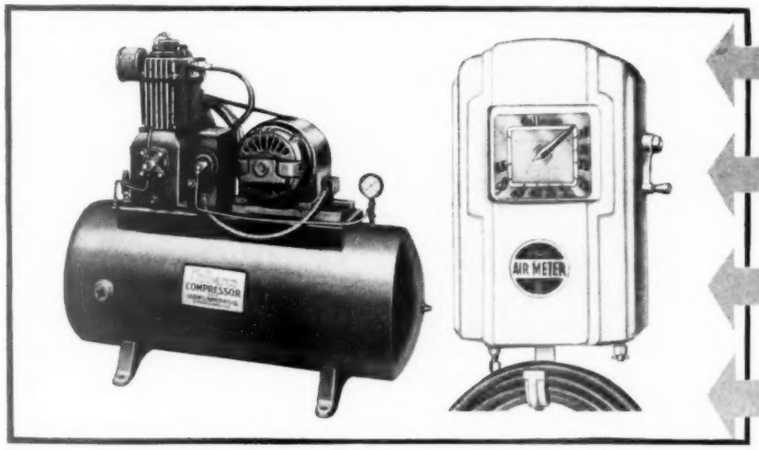

GILBARCO AIR METERS AND AIR COMPRESSORS

have been taken on at the shipyards in Kittery, Me., but the town couldn't accommodate all of them, so Boston, 57 miles away, is furnishing daily commuters to the Navy base.

Another indication of the vital role that the private automobile is playing in national defense preparations is the situation at Camp Edwards, which is being made ready for thousands of soldiers. Construction workers arrive daily in more than 7000 cars, coming from cities as far as 40, 50 and 60 miles away. Roads are bad, but there is no substitute for automobile transportation on this Cape Cod project as the nearest railroad is miles away.

In a nutshell, the "defense boom" means new consuming areas for oil marketers, new customers—through more people being able to afford automobiles, and old customers using their cars more, for both business and pleasure.

One of the buildings being erected at Charlestown, Indiana, ordnance project

New Construction on U. S. Defense Projects in 32 States

Location	Product	Operator	Plant Cost	Status of Plant	Department
ALABAMA					
Childersburg	smokeless powder	E. I. du Pont de Nemours	$47,997,000	New	Navy
Muscle Shoals	nitrates	Tennessee Valley Authority	$6,500,000	Improved	War
Muscle Shoals	ships	Gulf Shipbuilding	$2,500,000	New	Navy
Gadsden	shell forging	Lansdowne Steel & Iron Co.	$1,138,000	New	War
CALIFORNIA					
San Diego	aircraft	Consolidated Aircraft	$17,536,975	Expanded	Navy
San Francisco	ships	Bethlehem Steel	$12,662,000	Expanded	Navy
Long Beach	aircraft	Douglas Aircraft	$11,254,700	Expanded	War
Englewood	air plane frames	North American Aviation Co.	$2,270,405	Expanded	War
Downey	aircraft	Vultee Aircraft, Inc.	$4,294,798	Expanded	War
San Pedro	ships	Bethlehem Steel	$4,006,000	New	Navy
San Pedro	ships	L. A. Shipbuilding Co.	$850,000	Expanded	Navy
COLORADO					
Denver	small arms ammunition	Remington Arms	.....	New	War
CONNECTICUT					
East Hartford	aircraft engines	United Aircraft Pratt & Whitney Div.	$15,559,009	Expanded	Navy
Hartford	gages	Niles-Bement-Pond Co., Pratt & Whitney Div.	$1,140,000	Expanded	War
Bridgeport	lathes	Bullard Machine Co.	$1,138,000	Expanded	War
Hartford	weapons	Colt's Patent Fire-arms Mfg. Co.	$8,074,406	Expanded	War
Groton	ships aircraft propellers	Electric Boat Co. United Aircraft	$4,600,000 $1,961,746	Expanded Expanded	Navy Navy
Stratford	aircraft	Vought Sikorsky Div., United Aircraft	$1,600,000	Expanded	Navy
Hartford	aircraft engine parts	Hartford Machine Screw Co.	$469,000	Expanded	Navy
New Britain	aircraft engine parts	New Britain Machine Co.	$409,000	Expanded	Navy
New Britain	machine tools	New Britain Machine Co.	$915,000	Expanded	
GEORGIA					
Macon	ordnance	Unannounced	$800,000	New	Navy
ILLINOIS					
Wilmington	T.N.T., D.N.T. tetryl	E. I. du Pont de Nemours Co.	$31,000,000	New	War
Wilmington	ammunition loading	Sanderson and Porter	$14,000,000	New	War
Chicago	aircraft engine gears	Foote Bros. Gear and Machine Co.	$1,020,000	Expanded	Navy
Chicago	ordnance	Stewart-Warner Co.	$4,000,000	New	War
Chicago	ordnance	Goss Printing Press Co.	$864,600	Expanded	Navy
Chicago	Wright "2600" engines	Studebaker Corp.	$49,700,000	Expanded	War
INDIANA					
Charlestown	smokeless powder	E. I. du Pont de Nemours Co.	$74,000,000	New	War
Charlestown	bag loading	Goodyear Engineering Corp.	$15,227,080	New	War
Union Center	shell loading	Todd & Brown, Inc.	$11,500,000	New	War
South Bend	Wright "2600" engines	Studebaker Corp.	(*)	Expanded	War
Ft. Wayne	Wright "2600" engines	Studebaker Corp.	(*)	Expanded	War
Indianapolis	ordnance		$6,000,000	New	Navy
Indianapolis	aircraft	Curtiss-Wright Corp.	$14,090,350	Expanded	War
IOWA					
Burlington	shell loading	Day & Zimmerman Inc., and others	$44,273,384	New	War
KANSAS					
Wichita	aircraft	Boeing Aircraft Co., Stearman Aircraft Div.	$3,367,943	Expanded	War
Wichita	aircraft	Beech Aircraft Corp.	$1,620,000	Expanded	War
KENTUCKY					
West Henderson	anhydrous ammonia	Solvay Process Co.	$11,132,000	New	War
Louisville	guns	Westinghouse Electric & Mfg. Co.	$5,000,000	New	Navy
MAINE					
Bath	ships	Bath Iron Works	$2,400,000	Expanded	Navy
MARYLAND					
Hagerstown	air craft engines	Fairchild Airplane & Engine Corp.	$982,891	Expanded and New	War
Indian Head	powder	E. I. du Pont de Nemours & Co.	$3,490,000	Expanded	Navy
MASSACHUSETTS					
Quincy	ships	Bethlehem Steel	$14,227,500	Expanded	Navy
Greenfield	gages	Greenfield Tap & Die Corp.	$1,009,000	Expanded	War
West Springfield	aircraft engine parts	Perkins Machine & Gear Co.	$365,000	Expanded	Navy
Everett	super-chargers	General Electric	$5,873,800	New	War

New Construction on U. S. Defense Projects in 32 States

Location	Product	Operator	Plant Cost	Status of Plant	Department
MICHIGAN					
Midland	chemicals	Dow Chemical Co.	$10,000,000	New	War
Dearborn	aircraft engines	Ford Motor Co.	$21,965,420	New	War
Detroit	tanks	Chrysler Corp.	$20,000,000	New	War
Detroit	airplane engines	Bohn Aluminum & Brass Corp.	$1,216,000	Expanded	Navy
Flint	machine guns	General Motors Corp.	$20,000,000	Re-opened	War
Saginaw	machine guns	General Motors Corp.	(§)	Re-opened	War
Detroit	ordnance		$12,000,000	New	Navy
Detroit	aircraft engine parts	Aviation Corporation (Republic Aircraft Products Div.)	$532,000	Expanded	Navy
Grand Blanc Township, Genesee County	airplane engines	General Motors Corp.	$24,313,150	Expanded	War
MINNESOTA					
Minneapolis	ordnance	Northern Pump Co.	$5,473,297	Expanded	Navy
MISSISSIPPI					
Pascagoula	ships	Ingalls Shipbuilding Co.	$2,000,000	Expanded	Navy
MISSOURI					
St. Louis	small arms ammunition	U. S. Cartridge Co.	$18,600,000	New	War
Weldon Springs	T.N.T. and D.N.T.	Atlas Powder Co.	$11,325,000	New	War
Lake City	small arms ammunition	Remington Arms Co.	$81,075,261	New	War
E. St. Louis	chemicals	Monsanto Chemical Co.	(‡)	New	War
Kansas City	medium bomber assembly	North American Aviation Corp.	.....	New	War
NEBRASKA					
Omaha	medium bomber assembly	Glenn L. Martin Co.	.....	New	War
Omaha	ordnance	Omaha Steel Co.	$483,875	New	War
NEW JERSEY					
Camden	heavy forgings	Camden Forge Co.	$3,125,619	Expanded	War
Camden	ships	New York Shipbuilding Corp.	$10,500,000	Expanded	Navy
Caldwell	aircraft	Curtiss-Wright Corp.	(†)	Expanded	Navy
East Paterson	aircraft engines	Wright Aeronautical Corp.	$1,500,000	Expanded	War
Harrison	aircraft engine crankcases	Otis Elevator Co.	$6,954,735	New	War
Kearny	ships	Federal Shipbuilding Co.	$7,750,000	Expanded	Navy
Camden	radio equipment	R.C.A. Manufacturing Co.	$2,370,350	Expanded	Navy
Jersey City	ordnance	Westinghouse Electric Elevator Co.	$495,000	Expanded	Navy
Harrison	ordnance	Crucible Steel Co.	$125,000	Expanded	Navy
NEW YORK					
Niagara Falls	chemicals	E. I. du Pont de Nemours Co.	(‡)	New	War
Farmingdale, L. I., N. Y.	aircraft engines	Fairchild Engine & Airplane Corp.	$1,478,800	Expanded	Navy
Syracuse	aircraft propeller parts	New Process Gear Corp.	$348,000	Expanded	Navy
Farmingdale, L. I., N. Y.	aircraft	Republic Aviation Corp.	$5,210,513	Expanded	War
Utica	machine guns	Savage Arms Corp.	$17,600,000	Re-opened	War
Wheatfield Township, Niagara County	aircraft	Bell Aircraft Corp.	$1,023,200	Expanded	War
College Point	aircraft	Edo Aircraft	$365,000	Expanded	Navy
Staten Island	ships	Bethlehem Steel	$3,406,000	Expanded	Navy
Farmingdale, L. I., N. Y.	aircraft	Liberty Aircraft	$1,088,000	Expanded	Navy
Binghamton	aviation devices	Link Aviation Devices Inc.	$323,432	Expanded	Navy
Bethpage, L. I., N. Y.	aircraft	Grumman Aircraft	$3,500,000	Expanded	Navy
Rochester	ordnance	Bausch & Lomb	$512,000	Expanded	Navy
Syracuse	machine guns	General Motors Guide Lamp Div.	(§)	New	War
OHIO					
Ravenna	ammunition loading	Atlas Powder Co.	$14,215,000	New	War
Dayton	gages	Sheffield Gage Corp.	$910,000	Expanded	War
Canton	ordnance		$16,000,000	New	Navy
Lockland	aircraft engines	Wright Aeronautical Corp.	$42,488,548	New	War
Cleveland	airplane engine crankshafts	Ohio Crankshaft Inc.	$3,968,130	Expanded	War
Cincinnati	metal searchlight mirrors	Ferro Concrete Construction Co.	$500,000	New	War
Sandusky	T.N.T. and D.N.T.	Trojan Powder Co.	$39,388,330	New	War
Alliance	ordnance	Babcox & Wilcox Co.	$250,000	Expanded	Navy
Dayton	machine guns	General Motors	(§)	New	War
OKLAHOMA					
Tulsa	heavy bomber assembly	Douglas Aircraft Corp.	$10,000,000	New	War
OREGON					
Portland	ships	Willamette Iron & Supply Corp.	$1,000,000	Expanded	Navy
PENNSYLVANIA					
Philadelphia	ships	Cramp Shipbuilding Co.	$12,000,000	Expanded	Navy
Chester	ships	Sun Shipbuilding Co.	$2,500,000	Expanded	Navy
West Homestead	gun tubes	Mesta Machine Co.	$1,680,000	New	War
Williamsport	aircraft engines	Aviation Mfg. Corp.	$1,597,493	Expanded	War
Bethlehem	ordnance	Bethlehem Steel Co.	$1,342,797	Expanded	Navy
Philadelphia	armor plate	Henry Disston & Sons	$1,018,400	Expanded	War
Pittsburgh	aircraft	Curtiss-Wright Corp.	(†)	New	War
Coatesville	steel	Lukens Steel Co.	$2,160,000	Expanded	Navy
Canton	ordnance	Westinghouse Electric & Mfg. Co.	$16,000,000	New	Navy
RHODE ISLAND					
Woonsocket	gages	Taft-Peirce Mfg. Co.	$400,000	Expanded	War
TENNESSEE					
Wolf Creek Ordnance Plant near Milan	ammunition loading	Procter & Gamble	$14,000,000	New	War
TEXAS					
Baytown	toluol	Humble Oil & Refining Co.	$10,760,000	New	War
Orange	ships	Consolidated Steel Co.	$4,600,000	Expanded	Navy
Galveston	ships	Todd Galveston Dry Docks, Inc.	$2,254,342	Expanded	Navy
Ft. Worth	heavy bomber assembly	Consolidated Aircraft Corp.	.....	New	War
VERMONT					
Springfield	machine tools	Bryant Chucking Grinder Co.	$189,000	Expanded	War
VIRGINIA					
Radford	smokeless powder	Hercules Powder Co.	$35,000,000	New	War
Newport News	ships	Newport News Shipbuilding Co.	$14,000,000	Expanded	Navy
Pulaski	bag loading	Hercules Powder Co.	$9,376,390	New	War
Richmond	ordnance	Reynolds Metal Co.	$1,673,315	New	Navy
WASHINGTON					
Tacoma	ships	Tacoma Shipbuilding	$8,000,000	Expanded	Navy
Seattle	aircraft	Boeing Airplane Co.	$7,368,843	Expanded	War
Seattle	ships	Associated Shipbuilders	$700,000	Expanded	Navy
WEST VIRGINIA					
Morgantown	ammonia	E. I. du Pont de Nemours Co.	$15,000,000	New	War
South Charlestown	ordnance	Carnegie-Illinois	$50,353,000	Expanded	Navy
WISCONSIN					
Manitowoc	ships	Manitowoc Shipbuilding Co.	$1,000,000	Expanded	Navy
Fond du Lac	machine tools	Giddings & Lewis		Expanded	War

(*) Included in $49,700,000 item for Studebaker Corp. above.
(†) Included in $14,090,350 item for Curtiss-Wright Corp. above.
(‡) Included in $10,000,000 item for Dow Chemical Co. above.
(§) Included in $20,000,000 item for General Motors above.

State Inspections Show Need Of Tire, Bulb Replacements

Causes of Cars Being Rejected in State Motor Vehicle Inspections

STATE	Number of Cars Rejected First Visit	% of Total Registrations	% Rejections for Each Cause, to Total Rejections							
			Lights	Brakes	Steering	Exhaust	Wiper	Horn	Mirror	Misc.
Connecticut	149,917	33	14.4	14	5	0	0	0	0	15.5
Delaware	19,113	28	28	56	1.5	0	2	2	1.5	0
Maine	151,252*	76	48	21.9	6.2	1.6	2	2.5	0	0.9
New Hampshire	76,068	59	44.4	24.8	7.5	0	0	2.3	1.1	0
New Jersey	536,230	53	47.6	31.1	9.7	1.0	1	0.6	0.2	3.1
Pennsylvania	1,513,727	72	65.5	29.7	9.3	3.4	3.4	1.7	1.1	0
South Carolina	143,806	48	54	30	14	0	0	2	0	0
Vermont	57,766	64	50	23	7	4	5	3	1	0
Virginia	269,124	60	53.8	21.1	9.2	0	2.5	1.9	1.2	0
CITIES										
Minneapolis	.....	..	52	20	6.5	0	1.5	1	1	0
Portland, Ore.	.....	..	54.1	20.9	5.9	1.5	1.1	0.6	0	0

*Includes more than one cause of rejection.

Table above analyzes reasons for rejecting cars in 9 states requiring periodic inspection of motor vehicles. In a great many instances, as these figures show, the cause of rejection was a simple service or replacement item generally sold at service stations.

These figures tell a tale of sales opportunities lost by service stations to sell light bulbs, wiper blades, tires and other items BEFORE the cars go up for inspection.

For marketers in states without inspection laws, these figures are an indication of how many of their customers are driving with deficient lights, worn tires, wiper blades, etc. Certainly, if such high percentages of motorists in inspection-law states neglect to have these items attended to, it is safe to conclude that even higher percentages prevail among motorists whose cars are not periodically inspected.

The accompanying article analyzes these figures and other data, showing how marketers can impress on their station operators that many of their customers are not being sold items and service needed on their cars.

NEARLY three million cars in 9 states were found "unsafe to drive" when inspected under state motor vehicle inspections laws.

These "unsafe" cars — representing from 26% to 72% of total registrations in the 9 states—were ordered to have needed adjustments or repairs made and to replace burnt-out light bulbs, windshield wiper blades, worn-out tires and other deficient accessories and equipment, or be ruled off the road.

More than half — or 1,626,359 — of these nearly 3,000,000 cars were rejected on first inspection because their headlights, tail lights or other lights were not working properly; 69,851 were rejected because of wiper blades; and 44,584 because their horns wouldn't work (yet checking the horn is a sup-

LEFT—Interior view showing how New Jersey state inspection station handles two lines of cars. Outside view of same station is shown below

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Ever stop to think—*"Why so many Ford Trucks?"* Ever look into the record of these powerful, trustworthy units? Here it is—a record that clearly demonstrates Ford performance, economy, reliability!

THE RECORD: More Ford Trucks have been built, and more are in use this minute than any other kind.

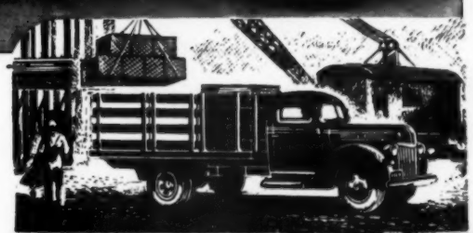
THE RECORD: Ford Trucks give amazing economy—shown in actual cost records of truck operators throughout America.

THE RECORD: Ford Trucks have extra big and extra sturdy brakes, axles, clutches, frames—there's a host of Ford Truck features that challenge comparison!

When you choose a Ford unit you get the just-right unit for your job! 42 body types. 6 wheelbases. Power choice of 85 or 95 hp engines.

Ask your Ford Dealer to prove Ford low cost and high efficiency on *your* job with *your* driver! Make this test and check the record.

Ford



FORD TRUCKS

AND COMMERCIAL CARS

posedly routine practice at many stations).

Figures for these 9 inspection-law states, compiled by NATIONAL PETROLEUM NEWS, raise the question whether among the nation's 30,000,000 motor vehicles there are not 16,000,000 with defective lights, 698,510 with wiper blades bad and 445,840 with horns not working.

There are 16 states and the District of Columbia, plus a few cities in other states, which have laws requiring periodic inspection of all motor vehicles (different types of inspection laws are explained further on in this article). If the car owner doesn't attend to the needs of his car, as pointed out in the inspection, it will be ordered off the road as "unsafe."

Table 2—Motor Vehicles Registered, Number Inspected and Number Rejected on First Visit

Data is on inspection periods in 1939, or first period in 1940.

State	No. Vehicles Registered 1939	Vehicles Inspected		Requiring Adjustment	
		Number	% of Reg.	Number	% of Reg.
Connecticut	453,263	433,181	95.6	149,917	33.1
Delaware	67,992	82,054*	120.7	19,113	28.1
Maine	199,023	172,404	86.6	151,252†	76
New Hampshire	128,821	127,433	98.9	76,068	59.0
New Jersey	1,019,537	973,856	95.5	536,230	52.6
Pennsylvania	2,099,234	2,051,121	97.8	1,513,727	72.1
South Carolina	300,716	211,045	70.2	143,806	47.8
Vermont	90,713	79,854	88.0	57,766	63.7
Virginia	452,743	437,600	96.7	269,124	59.4

*Includes reinspections of some vehicles.
†Includes duplications in that the figure is for total number of adjustments made, adjustments for more than one cause being made on some cars.

CAR owners, in a great many cases, must buy light bulbs, fuses, tires or tire repairs, wiper blades, rear view mirrors and other items—many, if not all, of which are sold at service stations. Some cars will require brake adjustments, and lighting and exhaust system servicing, obtainable at many stations.

Each of these car owners had to buy gasoline somewhere, sometime. The service station he last patronized before the inspection had a chance to sell him needed light bulb or wiper blade.

After the inspection, the station operator faces the competition of other stations, garages or cut-rate accessory stores at or near the point of inspection. So his best chance to sell the items is *before* the car is inspected.

Rejection of cars at the state inspection stations, even at the high present rates, is not because the equipment is not in the best of working order—but because it is deemed unsafe for driving. These facts on condition of car equipment in these 9 states, apply equally well to other states.

Among principal causes of rejections, (see Table I) when cars go in for their required inspections, is defective steering, wheel alignment and front ends out of adjustment. One source of these troubles is the lack of regular chassis lubrication.

Lack of regular chassis lubrication frequently results in broken spring leaves, broken shock absorbers, extreme wear of steering assembly bearings, wheel bearings and tie rods, which cause wheels to get out of alignment. Regular lubrication would not only avoid the expense of repairs and adjustments, it would also give station operators the opportunity to call it to customers' attention before trouble started. The car owner could then have the necessary adjustment made at less expense and at greater convenience than waiting until more serious trouble develops, or until it is pointed out at the inspection.

"Figures from inspection stations which have been in operation for several years indicate that a surprising number of the vehicles brought in are in unsafe mechanical condition," said an official of the American Assn. of Motor Vehicle Administrators, Washington, commenting on failure of car owners to know the defects of the vehicles they drive.

"While the owners must realize that their cars will have to meet certain inspection requirements, some reports show that approximately 50% of the vehicles at inspection stations for the first time are rejected because they fail to meet one or more mechanical standards (Table 2)," he said.

UNDER present driving conditions, certain mechanical defects in cars are bound to recur and to need adjustment in each inspection period, said the chiefs of the motor vehicle inspection bureaus in some states. This, they said, explained why some troubles show up in about the same proportion to the total number of cars tested year after year. Defects that recur in largest numbers are in lighting systems and in brakes.

"Our records indicate that driving conditions cause a recurrence of mechanical and accessory failures," said James A. Adams, chief inspector in Maine. "There is but a slight difference in the number of repairs and adjustments needed, during each inspection period."

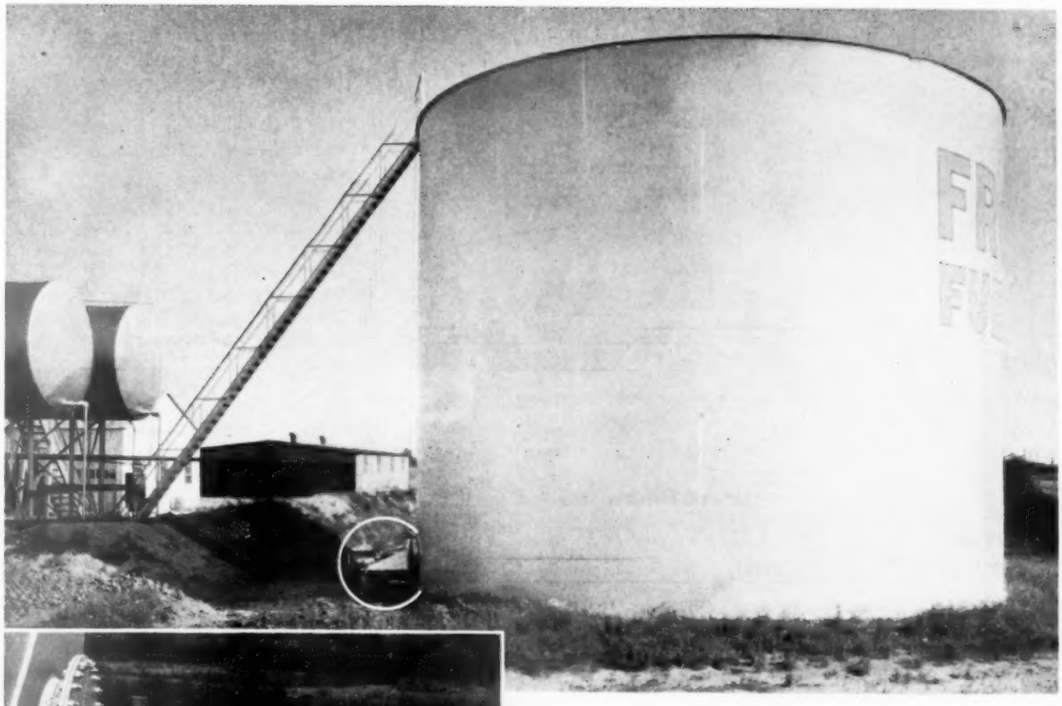
Lights must be adjusted and bulbs replaced more than any other single service or item, is the experience of the state inspection stations. Analysis of rejections defects, on the first inspection, in the 9 states studied, show an average of 45% for lighting. In Pennsylvania, during the first inspection period in 1940, over 65% of rejections were for this cause. In this state, 72% of the total number of vehicles inspected were rejected.

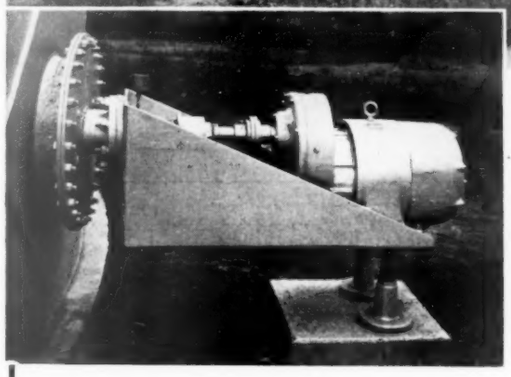
Commenting on reports from New Jersey, which showed nearly 48% of all rejections were because of defective lights, James J. Shanley, chief of the state testing division, said:

"Upwards of 130,000 rejections every 6-month period are because of inoperative rear and stop lights. All of this trouble could have been avoided if the owners had turned on their lights and walked around their vehicles before going in for inspections."

There's a powerful argument in those words for some oil company sales supervisor in New Jersey to point out the sales of light bulbs his stations are losing, through failure of the operators to

Portable inspection station used by South Carolina state highway department which are moved from town to town, remaining in each location from one week to two months





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Name ..... Title .....

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Portable inspection stations are used in Connecticut, where all motor vehicles are required by state law to be inspected twice a year. The work is under the Department of Motor Vehicles

note whether the rear lights are working on the cars of regular customers.

Defects in headlights, due to need of beam adjustments, new bulbs, or lenses, are a more frequent cause of rejection than out-of-order stop and tail lights, state reports show. Parking lights and fog and spotlights are a cause of few complaints.

The proportion of rejections for headlights and rear lights, to the total number of vehicles inspected, is as follows for 2 cities and 4 states:

State or City	Head Lights	Rear Lights
Portland, Ore.	39%	12%
Minneapolis	37%	15%
South Carolina	20%	16%
Virginia	40%	14%
Vermont	56%	21%
Maine	33%	13%

Inspection standards for lighting systems are described in the code of the American Standard Inspection Requirements for Motor Vehicles, which is the base of most state requirements. It sets forth the following General Lamp Inspection Limits:

"General lamp inspection includes the following types of lamps: head, rear clearance, signal, marker and adverse weather.

"Any of the following defects shall be cause for rejection:

"(a) Any bulb in any lamp required by law or regulation, or in any adverse weather lamp which fails to burn.

"(b) An improperly connected circuit which does not light the proper filaments for the different switch positions.

"(c) A cracked, broken or missing lens.

"(d) A lens that is rotated, upside down, wrongside out or is otherwise incorrectly installed.

"(e) A lens marked 'left' or 'right' not appropriately installed.

"(f) A multiple beam headlight lens, the name of which does not correspond with the name stamped on the lamp body.

"(g) A lamp which is not securely fastened to the vehicle.

"(h) A lamp showing a beam of color contrary to law or regulation.

"(i) Any defects in wiring or lighting equipment that would be likely to adversely influence the effectiveness of the lighting performance.

"(j) Any auxiliary equipment placed on, in, or in front of, the headlamp which is not a part of the original standard equipment.

"(k) Beam indicator lights which do not indicate the proper beam to the driver, and which do not operate satisfactorily."

The motor vehicle inspectors' code further provides that approval shall be refused when the light produced by any headlamp, or auxiliary lamp designed for use in place of a headlamp (whether measured in terms of maximum beam candlepower, average beam candlepower, lamp output, or other term) is less than 50% of the normal new lamp value. A light output of 70% or more of new lamp value, while not required in the code, is said to be desirable.

Code includes detailed methods for lamp focus inspection.

IT IS recommended in the standard code that at least one spare bulb and fuse for each type and size used, be carried in the car. Where law or regulation does not require this, the code states this should be suggested by inspectors to car owners.

Next to lights, defective brakes are the most frequent cause for rejection of cars at compulsory inspections. Proportion of rejections for this defect to the total rejections varies between 20 and 30% in most cases. In Delaware's 1940 Safety Inspection, nearly 50% of rejections on passenger cars were for defective foot brakes.

"Brakes have to be adjusted at recurring inspections, because of constant use due to heavy traffic in this state," said William D. Denney, Delaware vehicle commissioner, as a reason for the larger percentage of this defect than in other states. In New Jersey, over 30% of rejections are for this cause, and in Pennsylvania, with its hills, the same proportion of rejections holds.

"Brakes had to be repaired or replaced on fewer vehicles than before, but more adjustments had to be made," said T. E. Transeau, Director of Highway Safety in this state.

Many, many thousands of cars will be turned down, at their next trip to official inspection stations, because their tires are not deemed in good enough condition for safe driving. Their owners will have to buy new or recapped tires, or in some cases have permanent repairs made, before they can be driven again. Only one or 2 state authorities report condition of tires separately among rejection causes.

In Delaware, condition of tires is listed separately and 7% of rejections of passenger cars are for this cause. Pennsylvania puts it thus: "As to tires, 72.4% of the total number of vehicles inspected during the first period in 1940 were found to be in satisfactory condition and 75.4% of the commercial vehicles." There were more good tires on vehicles inspected in 1940 than in 1939, stated the highway safety director, in 2 cities that listed condition of tires separately among causes for rejection; less than 2% of rejections were for this cause.

TIRES are checked by visual examination, the same method that oil company supervisors teach station operators to use. The section on this subject in the standard inspection code reads:

"Tires shall be checked by visual examination and any one of the following defects shall be cause for rejection:

"(a) When the wear on any one or more tires at any part is excessive, as indicated in items 1, 2 and 3 following.

"(1) Passenger cars (including motorcycles). When the first outer body ply of cords is exposed.

"(2) Buses. When the first outer body ply of cords is exposed on the tread.

"(3) Commercial vehicles (including trailers). When cords of outer body ply of tire having not more than 4 body plies is exposed. For heavier tires, when worn through one-half of the number of plies in excess of 4 (as indicated by table).

"(b) Bulges. When temporary repairs are made by the use of blowout patches or boots. Repairs must be permanent.

"(c) When there are tread cuts or snags in excess of 1 inch in any direction as measured on the outside of the tire, and deep enough to expose the body cords, or when sidewall scuff, cuts or snags, which have damaged the body cords.

"(d) When there are loose, missing or defective bolts, nuts or lugs; bent, loose, cracked or defective rim or wheel flanges."

The code recommends that inspectors call the car owners' attention to an injury that might cause rapid deterioration, or failure, and advise that the tire be permanently repaired.

Again, many thousands of cars will

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No one coddles a drum. It is bounced from truck to pavement—skidded off a loading platform—dropped with a resounding bump into the hold of a ship.

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INDEPENDENT AND HELPFUL

be rejected at their next inspection because of a defect in a very small appliance—their windshield wiper blades. In one state, reports show that 5% of rejections are for this cause.

If the station salesman called car owner's attention to the fact the car might not get by the coming inspection, because of this small defect, would mean the stations would sell more blades, because they will have to be bought some place before those car owners get their new "approved" certificates. Defective rear view mirrors, or mirrors out of adjustment, cause a small proportion of rejections. The standard code contains these instructions for inspecting wipers and mirrors:

"Windshield Wiper:

"(a) Shall be so constructed and located as to be controlled and operated by the driver.

"(b) Shall be in good working condition, capable of cleaning glass so as to afford driver a clear view ahead.

Note. If more than 1 wiper, all must operate.

"Sleet Remover:

"(a) Shall be so constructed as to be controlled or operated by driver.

"(b) Shall be in good working condition, capable of cleaning glass.

"(c) Must be free from interference with control of vehicle and not be a fire hazard.

"Rear View Mirror:

"(a) Shall be free from blemishes, not tarnished or broken, nor contain any defect that will prevent adequate rear view of the highway.

"(b) Shall be properly and securely fastened to prevent excess vibration.

"(c) Shall be so mounted as to give adequate view of the highway to the rear, and offer no interference with driver's vision."

Not all of the 16 states with motor vehicle inspection laws have active inspection programs now. Authorities say, however, that over 9,000,000 motor vehicles are inspected under these laws from 1 to 4 times a year. There is discussion to have similar laws adopted in other states. Six other states have enabling acts, which permit municipalities, sometimes over a certain population, to set up their own compulsory inspection programs. Pennsylvania, Maryland and Massachusetts were the first states to pass laws requiring vehicle inspection, in 1929 (Table 3).

SOME states own and operate the inspection stations direct. They buy or lease buildings, purchase the equipment, hire and train inspectors and supervisors and have complete jurisdiction over the operations. These are generally states of small area, where all car owners, without much inconvenience, can take their cars to one of a small number of stations. New Jersey operates under this type of law.

Other states license garages and service stations to make the inspections, but are supervised by state agents. Pennsylvania has this kind of law and around 9000 garages and a few service stations have been licensed.

Supervision is by the Pennsylvania Motor Police. Inspection agencies under this kind of law are almost uniformly garages. A few independent service stations in Pennsylvania, for example, hold licenses. Stricter requirements as to the floor space that must be available for testing cars and the fact the inspection must be made by an experienced automobile mechanic, makes it impracticable for many stations to do this work.

The inspection stations owned and operated by states or cities do no repair or adjustment work. Inspectors are forbidden to recommend car owners to any garage or service station, for repairs or replacement equipment. When the inspecting is done in licensed garages, the car owner is free to take his car any other place to have work done, and then come back for a re-inspection. The inspecting garage obviously has first call on the work, however, and gets a good share of it, because most of the cars inspected there will belong to car owners in the community. Their owners go regularly to the same place for their inspections. Some seek to stand in the good graces of the proprietor by having any required work done there.

SOLE purpose of the inspections is to promote safer driving, by discovering defective parts, or maladjustments that might cause the car to function improperly on the street or highway, and thus lead to an accident. Some states require the inspection of all equipment that might lead to an accident, if the equipment failed to function properly, while other states specify only certain equipment. South Carolina, for example, requires only inspection of brakes, horn, lights and steering on private cars. In some states, equipment tested is a matter of executive ruling.

When a car passes inspection, the owner is given a certificate to carry or put in the corner of his windshield, authorizing him to operate the vehicle until the end of the next inspection period. Failure of the owner to make the adjustments or replacements specified at the inspection, may lead to taking away his driving license, or a court fine. Where the owner believes he is being asked to have work done that is not necessary to safe operation, he may appeal to the supervisors. In states authorizing garages to make the inspections, he may take the car to another garage. Where a garage is found to be "high pressuring" the car owner, the license to inspect may be removed. The authorities say the tendency is for the inspection to be too lenient, rather than too severe, due to car owners going to neighborhood garages whose proprietors want to keep motorists' patronage.

Most states have 2 inspection periods a year, a few only 1 and a few 3 or 4. The car owner pays a fee of 25 or 50c for each inspection. Some states make the fee $1 a year.

Table 3—States With Laws Requiring Compulsory Inspections of all Motor Vehicles

A—Under State Authorities—

Two methods of inspection are (1) official stations, owned and operated by the state, (2) authorized stations, the work being done in a private garage, or service station, licensed and supervised by the state.

State	Number of Inspections Per Year	Method of Inspecting
Colorado	2	Authorized
Connecticut	2	State-owned
Delaware	1	State-owned
Dist. of Columbia	1	Dist.-owned
Maine	2	Authorized
Maryland	1	Authorized
Massachusetts	2	Authorized
Mississippi	1–2	Authorized
New Hampshire	1	Authorized
New Jersey		State-owned
New Mexico	3	Authorized
Pennsylvania	2	Authorized
S. Carolina	2	State-owned
Utah	1–2	Authorized
Vermont	2	Authorized
Virginia	2	Authorized
Washington		State-owned

New Jersey sets inspection periods by proclamation.

In Illinois all trucks must be inspected before being registered.

In New York, for hire buses over 7 ton capacity subject to inspection.

B—Where state law authorizes municipalities to require inspections and determine methods—

Illinois (1-2) ..... City-owned
Municipalities of 40,000 and over

Iowa (1-2) ..... City-owned
All cities, towns

Minnesota ..... City-owned
All municipalities

Oregon (2) ..... City-owned
Cities of 100,000 and over (Portland)

Tennessee ..... City-owned

Texas (Not over 4) ..... City-owned
Municipalities of 290,000 or over

Cities Operating Inspection Stations

Motor vehicle inspection stations are maintained in the following cities either under state enabling laws or by city ordinance as listed by the American Assn. of Motor Vehicle Administrators:

Chicago	Memphis, Tenn.
Chattanooga, Tenn.	Miami, Fla.
Cincinnati, O.	Miami Beach, Fla.
Des Moines, Ia.	Norwood, O.
Evanston, Ill.	Omaha, Nebr.
Knoxville, Tenn.	Portland, Ore.
Lincoln, Nebr.	Sioux City, Ia.

He *has* to take chances

Your product *doesn't*

A POLICEMAN never knows what dangers may be lurking in the shadows of his beat. He accepts peril, risks his life, takes chances as his duty.

Dangers lurk, too, in the path of every product shipped in drums. Dangers that may imperil a fine product and a cherished reputation. Yet no chances need be taken. Shipments can be made with safety, with confidence, with no risk to a single drop—in Tri-Sure-equipped drums.

Tri-Sure Closures eliminate all the hazards a shipment can face—tampering, pilferage, substitution, leakage and waste—because the Tri-Sure seal cannot be removed unless it is deliberately destroyed, the Tri-Sure plug is always held tightly in place, the Tri-Sure flange assures complete drainage.

Don't take chances with your next shipment. You don't have to. Ship the *sure* way—the Tri-Sure way—and protect your product, your reputation and your customers. Write today for complete information on Tri-Sure Closures.

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3. RELIABILITY. General American's long-standing reputation for dependable custodianship is your assurance.
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A DIVISION OF GENERAL AMERICAN TRANSPORTATION CORPORATION

Wisconsin Oil Jobbers Announce Program

MILWAUKEE—In addition to the speakers for the Annual Convention and Equipment Show of the Wisconsin Petroleum Association to be held at Hotel Schroeder, Milwaukee, Feb. 11-12-13, Norman H. Ott, Milwaukee, Pate Oil Co., and president of the association, announced as one of the principal speakers, Harry C. Mougey, technical director, research laboratory of the General Motors Corp. Mr. Mougey will talk on the second day of the convention, Feb. 12.

Speakers listed previously include Mark McKee, director, Pan American Airlines, who will talk on aviation fuels and aviation defense. Also on the program are Wisconsin's Governor Heil, Mayor Carl Zeidler of Milwaukee, Tom Collins, publisher of the Kansas City Journal; Henry Heineman, attorney for the Wage and Hour Division, Labor Dept., Washington, D. C.; R. A. Ludlow, New York, secretary of A.P.I. Lubrication Committee, and District Atty. Herbert J. Steffes of Milwaukee.

Among the matters of legislation to be discussed will be the abuses of state funds of state gasoline taxes.

Roy L. Brecke, executive secretary of the association, pointed out that the oil men "are the state's greatest free tax collection agency", collecting some $22,800,000 in gas taxes in 1940 and $912,000 above the previous year.

"There has been much abuse on refunding gas taxes at the rate of 4c per gallon which is paid back to users of farm equipment. For example, in January, 1940, the refunds amounted to $200,927 and in February, 1940, to $119,838.83, compared to February of 1939, $98,622.96 and in March of this year, 1940, $118,662.30 and in 1939, $87,034.63. That is using a lot of gasoline for tractors and for farm gasoline for months that farmers do a small amount of their work. We want legislation to correct the abuses of a legitimate refund," Brecke said.

James S. Harrison, Harrison Oil Co., convention chairman, announced that he anticipates a complete sell-out of the exhibit spaces, judging from inquiries received. Mr. Harrison said, "We are giving the exhibitors this year something entirely new in state conventions and equipment shows in that on Tuesday night, the first night of the convention, there will be a rathskeller, compliments of the association, held in the exhibition hall, which will consist of our famous Milwaukee bratwurst, sauerkraut and beer, along with this there will be entertainment. In addition we are inaugurating a quiz program, which will be exceptionally interesting in that all questions will pertain to the oil industry and its future," Mr. Harrison concluded.

MARKETS

California

LOS ANGELES, Feb. 1. — A California supplier was reported to have sold the past week to Thailand interests, 15,000 tons of diesel oil and 3000 tons of gas oil, in drums at around $1.26 per bbl. Shipment was scheduled to be made early in February in Thailand controlled vessels. Other similar deals were reported to be pending.

Small quantities of Huntington Beach crude were reported offered at 15c per bbl. under the field schedule.

At independent plants in the Los Angeles Basin, cracked fuel oil was quoted at $0.525 to $0.575 per bbl. according to reports. In the same area, straight run fuel oil was said to range from $0.63 to $0.67 per barrel.

Rack prices on third grade gasoline at independent Basin plants were reported advanced the past week 0.25c, bringing the range to 4.75 to 5.25c per gal. Tank wagon quotations on leaded gasoline at these plants were 6.75 to 7.75c and Ethyl, 7.75 to 8.75c, according to reports.

Gulf

NEW YORK, Feb. 1.—With the exception of a 0.25c advance to 4c for 72-74 oct. leaded gasoline, asking prices reported for refined products at the Gulf were unchanged the past week.

One refiner said he had received some "feelers" for gasoline and No. 2 fuel oil but did not disclose any details. No open spot cargo sales were reported, in New York or from the southwest.

A cargo of min. 80 oct. (1939 Research) gasoline was available at 4.375c while another cargo of the same grade was being offered at 4.25c, according to reports. Asking prices reported by refiners for min. 80 oct. ranged from 4.25 to 5.25c.

Pennsylvania

CLEVELAND, Feb. 1. — Kerosine and fuel oils were quoted higher by refiners in the Bradford-Warren district of Western Pennsylvania the last week in January. Some lower field refiners also reported advancing their quotations for these products. Wax was quoted 0.15c lower, while lube oil quotations were for the most part reported unchanged.

Advances in kerosine and fuel oil quotations reported by upper field refiners brought quotations for these products up generally 0.125c to 5.375c for 45 w.w. kerosine, 5.25-5.375c for No. 1 fuel, 5.125-5.375c for Nos. 2 and 3 fuels, and one refiner reported quoting 5.125c for 36-40 gravity fuel.

A refiner who had previously reported withdrawing his quotations for low pour test neutrals said he was back in the market and reported new quotations for 200 vis. of 24.50c for zero pour, 23.50c for 10 pour and 22.50c for 15 pour; 150 vis., 22.50c for zero pour, 21.50c for 10 pour and 20.50c for 15 pour. Quotations reported for 25 pour, 200 vis., ranged from 21 to 22c; 150 vis., from 19 to 20c. At the end of the week, 5 refiners reported quoting 14c for 25 pour test bright stock.

Quotations reported for both 122-124 and 124-126 A.m.p. white crude scale wax ranged from 2.50 to 2.75c, New York, down 0.15c.

Mid-Continent

TULSA, Feb. 1. — Mid-Continent 150-160 vis. D bright stock was up 0.5 to 1c a gal., last week, to 13.50c for 0-10 pour, 13c for 10-25 pour, when an Oklahoma refiner reported advancing his quotations. Same refiner reported advancing his quotation 0.5c to 12.50c for 150-160 vis. E bright. Quotations reported by other refiners for these products ranged up to 16c, 15.50c and 15c, respectively.

Domestic demand for viscous neutrals was heavy, one refiner said. Reports indicated that demand for most grades of lubes was in good volume for domestic shipment; "fair" for export. Several "rather large sales" were said to have been made against contracts. Reports of "a few" inter-refinery sales also were heard. Stocks continued low and closely held, refiners said.

Demand for heavy fuel, especially railroad fuel, was "very heavy," several refiners said. An Oklahoma refiner said he was oversold on No. 6 fuel, and withdrew his 65c quotation; no other Oklahoma refiners reported quoting for open spot sale. Customers are being notified to limit their instructions to contract minimums, according to several refiners.

Gasoline demand against contracts was good, fair weather having increased consumption, reports indicated. Five Oklahoma refiners reported open spot quotations for 80-82 oct. Ethyl gasoline, one at each of the following prices: 4.625c, 5.25c, 5.375c, 5.625c and 6c. An Oklahoma refiner reported open spot sale of 1 car 72-74 oct. at 5c; quotations reported by other Oklahoma refiners ranged from 4.375c to 5c.

Mid-Western

CHICAGO, Feb. 1. — No changes in quotations for refined products were reported by refiners or tank car marketers in Chicago the past week.

Open spot quotations of 5.375c and 6c for 80-82 octane and Ethyl gasoline were reported by two refiners. Quotations reported by marketers ranged from 4.25 to 4.375c for this grade.

Several suppliers reported good movement of industrial fuels, and steady demand for all grades of burner fuels.

Open spot sales reported by four tank car marketers during the week, totaled as follows: 20 cars of 72-74 oct. gasoline at 3.75c; 12 cars of 80-82 oct. Ethyl, 10 cars at 4.25c, 2 cars at 4.375c; 1 car of 41-43 kerosine at 4c; 2 cars of range oil, 1 at 3.75c, 1 at 3.875c; and 2 cars of No. 2 fuel at 3.25c, FOB Group 3.

Quotations reported by marketers ranged from 3.75 to 3.875c for 72-74 oct.; 3.50 to 4c for 41-43 kerosine; 3.375 to 3.875c for range oil; and 3 to 3.50c for No. 2 fuel. Quotations reported by refiners ranged from 4.375 to 5c for 72-74 oct; 4.125 to 4.25c for 41-43 kerosine; 3.50 to 3.625c for No. 2 fuel; and 3.875 to 4c for range oil.

Atlantic Coast

NEW YORK, Feb. 1.—Some grades of gasoline were priced higher, some lower, along the Atlantic Coast, while kerosine, light and heavy fuels were quoted lower at New York harbor, according to suppliers' reports the past week.

Low quotations reported for min. 80 oct. (1939 Research) gasoline were down 0.5c to 6c at Wilmington, and 0.125c to 6.125c at Savannah and Jacksonville.

Tank car quotations reported for 72-74 oct. gasoline were up 0.2c to 6.10c at Albany, 0.3c to 6.20c at Portland and Providence, and for 65-66 oct., up 0.25c to 5.50c at Boston.

Reductions of 0.2c in their quotations for kerosine and light fuel oils at New York were reported by several suppliers.

Tank car quotations reported at the Harbor for kerosine ranged upwards from 5.10c, barges from 5c. Tank car quotations for Nos. 2 and 3 fuels at New York ranged upwards from 4.50c, barges from 4.40c.

Marine diesel oil, ships' bunkers, was quoted 10c lower at New York harbor when several suppliers reported reducing their quotations to $1.85 per bbl.

REFINERY and SEABOARD PRICES

In bulk lots by Motor Transport, Tank Car, Barge or Tanker as shown

(NOTE—Parenthetical figures after prices indicate number of companies quoting when less than three companies are quoting.)

HOW PRICES ARE REPORTED—

Refinery and Seaboard prices in National Petroleum News are gathered by PLATT'S OILGRAM and are as published in the Monday issue of the OILGRAM.

PLATT'S OILGRAM is a reporting service issued in three identical editions daily from News Bureaus at New York, Cleveland, and Tulsa, Okla. PLATT'S OILGRAM gathers and publishes what its publisher and representatives believe to be accurate news of sales, prices and current happenings affecting the oil industry and that will be of interest to its subscribers. As this information is usually private, OILGRAM reports it according to what it is able to obtain from sources deemed reliable.

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Prices shown in the tables are quotations (meaning sellers' general offers or posted prices), or actual sales prices, reported to OILGRAM by refiners for "open spot" transactions, except as otherwise specified.

Prices arrived at by discounts off a specified price or "market date of shipment," prices named in contracts or prices arrived at in accordance with any arrangement made prior to date of sale, are not for "open spot" transactions and therefore are not considered in making the price tables. Prices made to brokers and prices in "Inter-refinery" transactions are also not considered except as may be noted.

All prices are for "immediate" shipment except in Gulf Coast bulk transactions where shipment is generally to be made in ninety days. Prices are FOB refineries, pipelines, or tanker terminals in districts designated.

Prices shown are for quantities in bulk such as tank car lots, motor transport lots or barge lots; and in cents per gallon; heavy fuel oils are in dollars per barrel of 42 U.S. gallons; wax and petrolatums are in cents per pound. Prices applying to barges or cargoes only are so designated.

Prices do not include taxes or inspection fees. Prices are published at the close of the business day.

Mid-Western prices in the tables were gathered from refiners with offices located in Chicago and the surrounding territory. While the prices are quoted on a Group 3 (Oklahoma) freight basis, this is in accordance with the custom of the oil industry which uses Group 3 as a price basis for the ease of comparing prices even when the material originates in another refining district. Other refinery prices are given by and for the particular refining district where the material is made and from which it is shipped.

When prices obtained by OILGRAM do not conform to these conditions the exception and the new conditions are noted in the news lead or in conjunction with the price table by footnote or otherwise, for the particular refinery or sales district involved.

Crude oil and products covered by OILGRAM'S news and price service, except where noted, have been represented to the publisher as fully up to the customary trade specifications indicated and according to the generally accepted methods of test; and all crude oil and all products thereof as having been lawfully produced and transported.

Any apparent error should be reported to the nearest OILGRAM or National Petroleum News office at once as no correction will be made after the second issue of the OILGRAM or National Petroleum News following its publication.

Summary of Daily Gasoline Prices (Jan. 28 to Feb. 3)

	Latest Prices Mon. Feb. 3	Jan. 31	Jan. 30	Jan. 29	Jan. 28
U. S. Motor, (ASTM octane)					
80-82 octane Ethyl:					
Oklahoma	4.625– 6.00	4.625– 6.00	4.625– 6.00	4.625– 6.00	.....
Mid-Western (Group 3 basis)	5.375–6.00 (2)	5.375–6.00 (2)	5.375–6.00 (2)	5.375–6.00 (2)	.....
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	5.50 (1)	5.50 (1)	5.50 (1)	5.50 (1)	.....
W. Tex. (For shpt. to Tex. & N. M. dest'ns.)	5.625 (1)	5.625 (1)	5.625 (1)	5.625 (1)	.....
72-74 octane:					
Oklahoma	(a) 4.375–5.00	(a) 4.375–5.00	(a) 4.375–5.00	(a) 4.375–5.00	(a) 4.375–5.00
Mid-Western (Group 3 basis)	4.375– 5.00	4.375– 5.00	4.375– 5.00	4.375– 5.00	4.375– 5.00
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	4.50 – 5.125	4.50 – 5.125	4.50 – 5.125	4.50 – 5.125	4.50 – 5.125
W. Tex. (For shpt. to Tex. & N. M. dest'ns.)	4.625 (2)	4.625 (2)	4.625 (2)	4.625 (2)	4.625 (2)
63-66 octane:					
Oklahoma	4.00 – 4.50	4.00 – 4.50	4.00 – 4.50	4.00 – 4.50	4.00 – 4.50
Mid-Western (Group 3 basis)	4.00 – 4.50	4.00 – 4.50	4.00 – 4.50	4.00 – 4.50	4.00 – 4.50
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	4.125– 5.00	4.125– 5.00	4.125– 5.00	4.125– 5.00	4.125– 5.00
W. Tex. (For shpt. to Tex. & N. M. dest'ns.)	4.125 (2)	4.125 (2)	4.125 (2)	4.125 (2)	4.125 (2)
60 octane & below:					
Oklahoma	3.625– 4.125	3.625– 4.125	3.625– 4.125	3.625– 4.125	3.625– 4.125
Mid-Western (Group 3 basis)	3.625– 4.125	3.625– 4.125	3.625– 4.125	3.625– 4.125	3.625– 4.125
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	3.75 – 4.50	3.75 – 4.50	3.75 – 4.50	3.75 – 4.50	3.75 – 4.50
W. Tex. (For shpt. to Tex. & N. M. dest'ns.)	3.875 (2)	3.875 (2)	3.875 (2)	3.875 (2)	3.875 (2)
Motor Gasoline, 72-74 octane (ASTM)					
New York harbor	5.50 – 6.80	5.50 – 6.80	5.50 – 6.80	5.50 – 6.60	5.50 – 6.60
Philadelphia district	5.50 – 7.00	5.50 – 7.00	5.50 – 7.00	5.50 – 7.00	5.50 – 7.00
Baltimore district	5.50 – 6.75	5.50 – 6.75	5.50 – 6.75	5.50 – 6.75	5.50 – 6.75
Motor Gasoline:					
74-76 Octane: (L-3)					
Bradford-Warren (Western Penna.)	6.00 (2)	6.00 (2)	6.00 (2)	6.00 (2)	6.00 (2)
Other Districts (Western Penna.)	5.75 – 6.00	5.75 – 6.00	5.75 – 6.00	5.75 – 6.00	5.75 – 6.00

REFINERY PRICES

Gasoline—U. S. Motor (ASTM Octane) except where otherwise specified

Prices Effective	Feb. 3	Jan. 27
OKLAHOMA		
80-82 oct. Ethyl	4.625– 6.00	
72-74 oct.	(a) 4.375–5.00	(a) 4.375–5.00
63-66 oct.	4.00 – 4.50	4.00 – 4.50
60 oct. & below	3.625– 4.125	3.625– 4.125
60-62 400 e.p.	3.75–4.00 (2)	3.75 –4.00 (2)
MID-WESTERN (Group 3 basis)		
80-82 oct. Ethyl	5.375–6.00 (2)	
72-74 oct.	4.375– 5.00	4.375– 5.00
63-66 oct.	4.00 – 4.50	4.00 – 4.50
60 oct. & below	3.625– 4.125	3.625– 4.125
N. TEX. (For shpt. to Tex. & N. M. dest'ns.)		
80-82 oct. Ethyl	5.50 (1)	
72-74 oct.	4.50 – 5.125	4.50 – 5.125
63-66 oct.	4.125– 5.00	4.125– 5.00
60 oct. & below	3.75 – 4.50	3.75 – 4.50
60-62, 400 e.p.	4.125–4.75(2)	4.125–4.75(2)
W. TEX. (For shpt. to Tex. & N. M. dest'ns.)		
80-82 oct. Ethyl	5.625 (1)	
72-74 oct.	4.625 (2)	4.625 (2)
63-66 oct.	4.125 (2)	4.125 (2)
60 oct. & below	3.875 (2)	3.875 (2)
CENT. W. TEX. (Prices to truck transports)		
80 oct. & above	6.00 (1)	6.00 (1)
72-74 oct.	4.50 (1)	4.75 (1)
67-69 oct.	4.00 (1)	4.00 (1)
62 oct. & below	3.625 (1)	3.625 (1)
KANSAS (For Kansas destinations only)		
80-82 oct. Ethyl	5.50 (1)	
72-74 oct.	4.50 – 4.875	4.50 – 4.875
63-66 oct.	4.25 – 4.75	4.25 – 4.75
60 oct. & below	3.875– 4.125	3.875– 4.125

Prices Effective	Feb. 3	Jan. 27
ARK. (For shipment to Ark. & La.)		
72-74 oct.	4.50 (1)	4.50
70-72 oct.	4.375 (1)	4.375
60 oct. & below	3.875 (1)	3.875
WESTERN PENNA. (Motor gasoline.)		
Bradford-Warren:		
74-76 oct. (L-3)	6.00 (2)	6.00 (2)
Other districts:		
74-76 oct. (L-3)	5.75 – 6.00	5.75 – 6.00
CENTRAL MICHIGAN (FOB Central Mich. refinery group basis for shpt. within Mich.; shpts. may originate at plants outside Central group)		
U.S. Motor: (Oct. L-3):		
72-74 oct.	6.50 – 7.00	6.50 – 7.00
67-69 oct.	5.50 – 6.25	5.50 – 6.25
Str. run gasoline, excluding Detroit shpt.	4.25 – 5.00	4.25 – 5.00
OHIO (S. O. Ohio quotations for statewide delivery and subject to exceptions for local price disturbances)		
72-74 oct.	7.125	7.125
CALIFORNIA U.S. Motor:		
58-61 grav., 375-400 e.p., 65 oct. & above	5.50 – 6.50	5.50 – 6.50
54-58 grav., for outside state shipment	5.00 – 6.00	5.00 – 6.00
54-58 grav., for instate shipment	5.00 – 5.50	4.75 – 5.50

Kerosine, Gas & Fuel Oils

Prices Effective	Feb. 3	Jan. 27
OKLAHOMA		
41-43 grav. w.w.	4.00 – 4.25	4.00 – 4.25
42-44 grav., w.w.	4.25 – 4.375	4.25 – 4.375
Range Oil	4.00 – 4.125	4.00 – 4.125
No. 1 P.W.	3.875– 4.125	3.875– 4.125
No. 1 straw.	3.50–3.875 (2)	3.50–3.875 (2)
No. 2 straw.	3.50 – 3.875	3.50 – 3.875
No. 2 dark	3.375 (1)	3.375 (1)
U.G.I. gas oil	3.25 (2)	3.25 (2)
No. 3 fuel	3.375– 3.50	3.375– 3.50
No. 6 fuel		$0.65 (1)
14-16 fuel	$0.85 (1)	$0.85 (1)
MID-WESTERN (Group 3 basis)		
41-43 grav. w.w.	4.125– 4.25	4.125– 4.25
42-44 grav. w.w.	4.25 – 4.375	4.25 – 4.375
Range Oil	3.875–4.00 (2)	3.875–4.00 (2)
No. 1 p.w.	3.875– 4.00	3.875– 4.00
No. 2 straw.	3.50 – 3.625	3.50 – 3.625
No. 3	3.25 – 3.50	3.25 – 3.50
No. 5	$0.75–$0.85 (2)	$0.75–$0.85 (2)
No. 6	$0.55–$0.60 (2)	$0.55–$0.60 (2)
N. TEX. (For shpt. to Tex. & N. M. dest'ns.)		
41-43 grav. w.w.	4.00 – 4.75	4.00 – 4.75
No. 1 P.W.	3.875 (2)	3.875 (2)
KANSAS (For Kansas destinations only)		
41-43 grav. w.w.	4.25 (1)	4.25 (1)
42-44 gravity w.w.	4.375– 4.563	4.375– 4.563
No. 1 p.w.	4.00 – 4.25	4.00 – 4.25
No. 6 fuel	$0.65 (2)	$0.65 (2)

(a) One refiner reports quoting "4 to 4.50c" for 72-74 oct., the lower price applying only to shipment into restricted competitive areas.

REFINERY PRICES (Continued)

(NOTE—Parenthetical figures after prices indicate number of companies quoting when less than three companies are quoting.

Kerosine, Gas & Fuel Oil

(Continued)

Prices Effective	Feb. 3	Jan. 27
ARK. (For shipment to Ark. and La.)		
41-43 grav. w.w.	4.50 (1)	4.50
No. 1	4.00 (1)	4.00
No. 2	3.625 (1)	3.625
28-32 zero fuel	3.50 (1)	3.50
Tractor fuel, for shpt. to Ark. points only	4.25 (1)	4.25 (1)
WESTERN PENNA.		
Bradford-Warren:		
45 grav. w.w.	5.375	5.375
46 grav. w.w.	5.625 (1)	5.625 (1)
No. 1 fuel	5.25 – 5.375	5.25 – 5.375
No. 2 "	5.125– 5.375	5.125– 5.375
No. 3 "	5.125–5.375 (2)	5.125– 5.375
36-40 gravity	5.125 (1)	5.00–5.125(2)
Other districts:		
45 grav. w.w.	5.125– 5.375	5.125– 5.375
46 grav. w.w.	5.25 – 5.50	5.25 – 5.50
47 grav. w.w.	5.375– 5.625	5.25 – 5.625
No. 1 fuel	4.875– 5.00	4.875– 5.125
No. 2 "	4.875– 5.00	4.875– 5.00
No. 3 "	4.625–4.875 (2)	4.625– 4.875
36-40 grav., Pittsburgh dist. prices excluded	4.375– 4.625	4.375– 4.625
CENTRAL MICHIGAN (FOB Central Mich. refinery group basis for shpt. within Mich.; shpts. may originate at plants outside Central group.)		
47-49 gravity w.w.	5.50 – 5.75	5.50 – 5.75
P.W. Distillate	5.50 – 5.65	5.50 – 5.65
No. 3 gas oil, Str.	5.00 – 5.25	5.00 – 5.25
U.G.I. gas oil	4.25 – 4.50	4.25 – 4.50
Fuel Oils (Vis. at 100):		
500-700 Vis.		
300-500 Vis.	3.50 – 3.75	3.50 – 3.75
100-300 Vis.	3.875–4.125 (2)	3.875–4.125 (2)
OHIO (S. O. Ohio quotations for statewide delivery)		
Kerosine	5.625	5.625
CALIFORNIA		
40-43 grav. w.w.	4.50 – 6.00	4.50 – 6.00
San Joaquin Valley:		
Heavy fuel	$0.55 –$0.65	$0.55 –$0.60
Light fuel	$0.65 –$0.75	$0.65 –$0.75
Diesel fuel	3.00 – 4.00	3.00 – 4.00
Stove dist.	3.00 – 5.00	3.00 – 5.00
Los Angeles:		
Heavy fuel	$0.52 –$0.60	$0.52 –$0.60
Light fuel	$0.63 –$0.70	$0.60 –$0.70
Diesel fuel	3.00 – 4.00	3.00 – 4.00
Stove dist.	3.00 – 4.00	3.00 – 4.00
San Francisco:		
Heavy fuel	$0.80	$0.80
Light fuel	$0.90	$0.90
Diesel fuel	4.50	4.50
Stove dist.	5.50	5.50

Note: All above heavy fuels meet Pacific specification 400; light fuel, spec. 300; Diesel fuels, spec. 200; and stove distillate, spec. 100.

Lubricating Oils

WESTERN PENNA.

Prices are given by Penna. refiners as their quotations to jobbing and compounding trade only. Prices to other refiners generally are lower.

Viscous Neutrals — No. 3 col. Vis. at 70° F.

280 Vis. (180 at 100°) 420-425 fl.		
0 p.t.	24.50 (1)	....
10 p.t.	23.50 (1)	....
15 p.t.	22.50 (1)	....
25 p.t.	21.00 –22.00	21.00 –22.00
150 Vis. (143 at 100) 400-405 fl.		
0 p.t.	22.50 (1)	....
10 p.t.	21.50 (1)	....
15 p.t.	20.50 (1)	....
25 p.t.	19.00 –20.00	19.00–20.00 (2)
Cylinder Stocks		
Bet. stk., 145-155 vis. at 210°, 540-550 fl., No. 8 col.		
10 p.t.	16.50 (1)	16.50 (1)
15 p.t.	15.50 (1)	15.50 (1)
25 p.t.	14.00	14.00 –14.50
600 S.R. filterable	8.00 – 8.50	8.00
650 S.R.	8.00 – 9.00	8.00 – 9.00
600 fl.	9.00 –10.00	9.00 –10.00
630 fl.	11.00 –11.50	11.00 –11.50
MID-CONTINENT (F.o.b. Tulsa)		
Neutral Oils (Vis. at 100° F. 0 to 10 P.P.)		
Pale Oils:		
Vis. Color		
60-85—No. 2	5.25 – 5.75	5.25 – 5.75
86-110—No. 2	5.25 – 6.25	5.25 – 6.25
150—No. 3	8.00 –10.25	8.00 –10.25
180—No. 3	8.50 –10.50	8.50 –10.50
200—No. 3	8.50 –11.00	8.50 –11.00
250—No. 3	10.00 –12.00	10.00 –12.00
280—No. 3	10.50 –13.75	10.50 –13.75
300—No. 3	11.50 –14.25	11.50 –14.25

Lubricating Oils (Cont'd)

Prices Effective	Feb. 3	Jan. 27
Red Oils:		
180—No. 5	8.50–9.50 (2)	8.50–9.50 (2)
200—No. 5	8.50–10.50 (2)	8.50–10.50 (2)
280—No. 5	12.50 (1)	12.50 (1)
300—No. 5	11.00 –12.50	11.00 –12.50

Note: Viscous Neutrals, 15-25 p.p. generally are quoted 0.5c under 0-10 p.p. oils. Non-viscous oils, 15-25 p.p., generally are quoted 0.25c under 0-10 p.p. oils.

Bright Stock—Vis. at 210°		
200 Vis. D	18.00 (1)	18.00 (1)
150-160 Vis. D:		
0 to 10 p.p.	13.50 –16.00	13.00 –16.00
10 to 25 p.p.	13.00 –15.50	12.00 –15.50
25 to 40 p.p.	12.50–15.00 (2)	12.50–15.00 (2)
150-160 vis. E	12.50 –15.00	12.00 –15.00
120 Vis. D:		
0 to 10 p.p.	12.50 –15.25	12.50 –15.25
25 to 40 p.p.	14.375 (1)	14.375 (1)
600 S.R. Dark Green	7.00 (2)	7.00 (2)
600 S.R. Olive Green	8.00 – 9.50	8.00 – 9.50
631 S.R.	12.00 (1)	12.00 (1)
Black Oil	4.00–5.50 (2)	4.00–5.50 (2)

SOUTH TEXAS Neutral Oils

Vis. Color		
Pale Oils: (*Vis. at 100°F*)		
100 No. 1½-2½	5.25 – 5.50	5.25 – 5.50
200 No. 2-3	7.25	7.25
300 No. 2-3	7.75	7.75
500 No. 2½-3½	8.50	8.50
750 No. 3-4	8.75	8.75
1200 No. 3-4	8.875	8.875
2000 No. 4	9.00	9.00
Red Oils:		
200 No. 5-6	7.25	7.25
300 No. 5-6	7.75	7.75
500 No. 5-6	8.50	8.50
750 No. 5-6	8.75	8.75
1200 No. 5-6	8.875	8.875
2000 No. 5-6	9.00	9.00

CHICAGO (From Mid-Continent p.l. crude

Neutral Oils (Vis. at 100° F. 0 to 10 p.p.)

Pale Oils

Vis. Color		
60-85—No. 2	7.25 (1)	7.25
86-110—No. 2	7.25 (1)	7.25
150—No. 3	8.50 (1)	8.50
180—No. 3	9.50 (1)	9.50
200—No. 3	10.00 (1)	10.00
250—No. 3	11.00 (1)	11.00
Red Oils:		
180—No. 5	9.50 (1)	9.50
200—No. 5	9.50 (1)	9.50
250—No. 5	11.00 (1)	11.00
280—No. 5	12.00 (1)	12.00
300—No. 5	12.00 (1)	12.00

Note: Viscous oils, 15 to 30 p.p. are quoted 0.5c lower; 60-85 and 86-110 No. 2 non-viscous oils, 15 to 30 p.p., 0.25c lower.

Unfiltered Steam Refined: (Viscosity at 210°)		
140	8.75 (1)	8.75
160	9.50 (1)	9.50
200	10.50 (1)	10.50
Bright stocks, 160 vis. at 210, No. 8 color:		
0 to 10 p.p.	15.00 (1)	15.00
15 to 25 p.p.	14.00 (1)	14.00
30 to 40 p.p.	13.50 (1)	13.50
E filtered Cyl. Stock	12.50 (1)	12.50

Note: To obtain prices delivered in Chicago add 0.25c per gal.

Natural Gasoline

(Group 3 & Breckenridge prices are to blenders on freight basis shown below. Shipments may originate in any Mid-Continent manufacturing district.)

FOB GROUP 3		
Grade 26-70	2.375 (Sales)	2.375 (Sales)
FOB BRECKENRIDGE		
Grade 26-70	2.00 (Sales)	2.00 (Sales)
CALIFORNIA (FOB plants in Los Angeles basin)		
75-85, 350-375 e.p. for blending	4.75 – 5.00	4.75 – 5.00

Naphtha and Solvent

Prices Effective	Feb. 3	Jan. 27
(FOB Group 3)		
Stoddard solvent	5.50 – 5.875	5.50 – 5.875
Cleaners' naphtha	6.00 – 6.375	6.00 – 6.375
V. M. & P. naphtha	6.00 – 6.375	6.00 – 6.375
Mineral spirits	5.00 – 5.375	5.00 – 5.375
Rubber solvent	6.00 – 6.375	6.00 – 6.375
Lacquer diluent	6.25 – 7.375	6.25 – 7.375
Benzol Diluent	7.875 – 8.375	7.875 – 8.375
WESTERN PENNA.		
Untreated naphtha	5.50 – 5.75	5.50 – 5.75
Stoddard solvent	6.00	6.00 – 6.25
OHIO (S. O. Ohio quotations for statewide delivery):		
V.M.&P. naphtha, D.C. naphtha, Special Varnolene, Varnolene & Sohio solvent	8.75	8.75
Rubber solvent	8.25	8.25

Wax

White Crude Scale:

WESTERN PENNA. (Bbls., C.L., N. Y.)		
122-124 A.m.p.	2.50 – 2.75	2.50 – 2.75
124-126 A.m.p.	2.50 – 2.75	2.50 – 2.75
OKLAHOMA (Bbls. or burlap bags, C.L.)		
124-6 AMP	2.75 (1)	2.75 (1)
131-3 AMP	3.25 (1)	3.25 (1)

CHICAGO (FOB Chicago district refinery of one refiner, in bags or slabs loose, carloads. Melting points are EMP (ASTM) methods; add 3° F. to convert into AMP.)

Fully refined:		
122-124 (bags only)	5.60	5.60
125-127	5.60	5.60
127-129	5.85	5.85
130-132	6.15	6.15
132-134	6.40	6.40
135-137	7.15	7.15

Petrolatums

WESTERN PENNA. (Bbls., carloads; tank cars, 0.5c per lb. less.)		
Snow White	5.125– 6.125	5.125– 6.125
Lily White	4.375– 5.125	4.375– 5.125
Cream White	3.375– 4.125	3.375– 4.125
Light Amber	2.625– 3.25	2.625– 3.00
Amber	2.375– 2.875	2.375– 2.875
Red	2.125– 2.625	2.125– 2.625

Group 3 Freight Rates

To Division Headquarters Points of Standard Oil Co. of Indiana

	Gasoline-Kerosine		Distillate-Gas Oil-Fuel Oil	
	Cents per Cwt.	Cents per gal. 6.6 lbs.	Cents per Cwt.	Cents per gal. 7.4 lbs.
Chicago, Ill.	40	2.640	32	2.368
Decatur, Ill.	39	2.574	31	2.294
Joliet, Ill.	40	2.640	32	2.368
Peoria, Ill.	39	2.574	31	2.294
Quincy, Ill.	36	2.376	29	2.146
Indianapolis, Ind.	48	3.168	39	2.886
Evansville, Ind.	46	3.036	37	2.738
South Bend, Ind.	49	3.234	**42	**3.108
Detroit, Mich.	64	4.224	51	3.774
Grand Rapids, Mich.	58.5	3.861	**50	**3.700
Saginaw, Mich.	66	4.356	53	3.922
Green Bay, Wis.	51	3.366	41	3.034
Milwaukee, Wis.	43	2.838	34.5	2.553
LaCrosse, Wis.	46	3.036	37	2.738
Minneapolis-St. Paul	46	3.036	37	2.738
Duluth, Minn.	52	3.432	41.5	3.071
Mankato, Minn.	46	3.036	37	2.738
Des Moines, Ia.	36	2.376	29	2.146
Davenport, Ia.	39	2.574	31	2.294
Mason City, Ia.	42	2.772	33.5	2.479
St. Louis, Mo.	33	2.178	26.5	1.961
Kansas City, Mo.	28	1.848	22.5	1.665
St. Joseph, Mo.	28	1.848	22.5	1.665
Fargo, N. D.	63	4.158	50.5	3.737
Minot, N. D.	83	5.478	66.5	4.921
Huron, S. D.	53	3.498	42.5	3.145
Wichita				
From Ponca City	7.5	*0.495	7.5	†0.555
From Tulsa	12.5	*0.825	12.5	†0.925
From Cushing	11	*0.726	11	†0.814

*This rate also includes distillate rate at 6.6 lbs. per gal.

**This rate applies only to residual fuel and gas oil.

†This rate is exclusive of distillate which is based on 6.6 lbs. per gal. from Ponca City, Tulsa and Cushing, Okla., to Wichita. Includes only gas oil and fuel oil.

NOTE: There is no Group 3 rate to Wichita, Kans.

SEABOARD PRICES EXPORT AND COASTWISE

(NOTE—Parenthetical figures after prices indicate number of companies quoting when less than three companies are quoting.)

Atlantic Coast

(Prices are of refiners, FOB their refineries & their tanker terminals, & of tanker terminal operators, FOB their terminals)—Prices Effective Feb. 3

MOTOR GASOLINE

District:	Min. 80 Oct. '39 Research (Max. 2 cc. Lead)	72-74 Oct. (ASTM)	68-70 Oct. (ASTM)	65-66 Oct. (ASTM)	60-64 Oct. (ASTM)
N. Y. Harb.	5.75 – 6.50	5.50 – 6.80	5.50	5.50 (2)	....
N. Y. Harb., barges	5.75 – 7.00	5.25 – 5.50	5.25 (2)	5.25–5.50 (2)	....
Albany	5.70 (1)	6.10	....	....	....
Philadelphia	5.75 – 7.25	5.50 – 7.00	5.50 – 6.75	....	6.50 (1)
Baltimore	5.75 – 7.25	5.50 – 6.75	5.50 – 6.00	5.50 (1)	....
Norfolk	5.75 – 7.25	5.50 – 6.75	6.00 – 6.50	5.50 (1)	....
Wilm'ton	6.00 – 7.05	5.75 – 6.55	6.00 – 6.50	5.50 (1)	....
Char'ston	6.25 – 7.05	5.75–6.60 (2)	5.875–6.50 (2)	5.50 (1)	....
Savannah	6.125– 6.50	6.00	5.875– 6.125	....	5.875 (1)
Jacksonville	6.125– 6.50	6.00	5.875– 6.25	....	5.875 (1)
Miami	6.25–6.50 (1)	6.00 (1)	5.875–6.00 (2)	....	....
Tampa	6.25–6.50 (2)	6.00 (1)	5.875– 6.25	....	....
Pensacola	5.75–6.00 (1)	....	5.50–5.75 (1)	....	....
Mobile	5.75–6.00 (2)	5.50 (1)	5.375–5.625 (2)	....	....
Portland	5.70 (2)	6.20	6.20 (1)	....	....
Boston	5.70 (2)	5.50 – 6.20	5.50 (1)	5.50–5.95 (2)	....
Providence	5.60 – 6.50	6.20	....	....	....

FUEL OILS

	KEROSINE and or NO. 1 FUEL	No. 2	No. 3	No. 5	No. 6
N. Y. Harb.	5.10 – 5.30	4.50 – 4.70	4.50 – 4.70	$1.45 –$1.55	$1.25
N. Y. Harb., barges	5.00 – 5.20	4.40 – 4.60	4.40 – 4.60	....	....
Albany	5.50	4.90	4.90 (1)	$1.85 (1)	$1.45 (1)
Philadelphia	5.25 – 5.50	4.75	4.75	$1.37 –$1.47	$1.25
Baltimore	5.30	4.70	4.70	$1.47 (1)	$1.25
Norfolk	5.30 – 5.75	4.70	4.70	....	$1.25 (2)
Wilmington	5.25 – 5.75	4.70	....	....	....
Charleston	5.30 – 5.75	4.70 (2)	....	....	$1.20 (2)
Savannah	5.25 – 5.50	....	....	....	$1.20 (1)
Jacksonville	5.25 – 5.50	4.75 (1)	4.75 (1)	....	$1.20 (1)
Miami	5.25–5.50 (2)	....	....	....	....
Tampa	5.25 – 5.50	4.75 (1)	....	....	$1.15 (1)
Pensacola	5.125–5.375 (1)	....	....	....	....
Mobile	4.875– 5.125	....	....	....	....
Portland	5.40	4.90	4.90	$1.85 (1)	$1.25 –$1.45
Boston	5.30	4.80	4.80	$1.55 (2)	$1.25
Providence	5.30	4.80	4.80	$1.50 –$1.55	$1.25

	Bunker C Fuel Ships' bunkers (Ex Lighterage)	Diesel Oil Ships' bunkers (Ex Lighterage)	Diesel Oil Shore Plants	Gas House Gas Oil 28-34 Gravity
N. Y. Harbor	$1.25	$1.85	4.50	4.80
Albany	$1.45 (1)	$2.05	4.90	5.10
Philadelphia	$1.25	$1.95	....	....
Baltimore	$1.25	$1.95	4.70	4.70
Norfolk	$1.25	$1.95	4.70	4.70
Charleston	$1.20	$1.95	4.70	4.70
Savannah	$1.20 (1)	$1.95 –$1.995	....	....
Jacksonville	$1.20	$1.95 –$1.995	....	....
Tampa	$1.15	$1.95 –$1.995	....	....
Portland	$1.25 –$1.45	$2.05	4.90	5.00
Boston	$1.25	$1.95	4.80	4.90
Providence	$1.25	$1.95	4.80	4.90

New York Export Lubes

(Penna. Products in bbls. FAS New York)

Prices Effective	Feb. 3	Jan. 27
Bright stock:		
Light, 25 p.t.	22.00 (1)	22.00 (1)
Neutral oil:		
200 3 color, 25 p.t.	....	....
150 3 color, 25 p.t.	25.50 (1)	25.50 (1)
600 s.r., unfilt.	17.00 (1)	17.00 (1)
650 s.r., unfilt.	17.50 (1)	17.50 (1)
600 fl. s.r.	18.00 (1)	18.00 (1)
630 fl., s.r.	20.00 (1)	20.00 (1)

Wax

(Melting points are AMP. 3° higher than EMP. Export prices FAS c.l. Domestic prices FOB, in bags, c.l. Scale solid; fully refined slabs.)

Prices Effective Feb. 3

	New Orleans Export	N. Y. Domestic	N. Y. Export
Crude Scale:			
124-6 Yellow	2.50 (1)	....	2.50 (1)
122-4 White	....	2.50–2.75	2.50–2.75
124-6 White	2.50–2.75 (2)	2.50–2.75	2.50–2.75
Fully Refined:			
123-5	....	5.60 (c)	5.60 (2)
125-7	5.60 (1)	5.60 (c)	5.60
128-30	6.15 (1)	5.60–5.70	5.60
130-2	6.15 (1)	5.85	5.85
133-5	6.40 (1)	6.15	6.15
135-7	7.15 (1)	6.40	6.40
108-11 White Match wax (tight bbls.)			3.00 (1)

Naphtha

Prices Effective Feb. 3	V.M.&P. Naphtha	Mineral Spirits
Baltimore	9.50	8.00
New York Harbor	9.00 – 9.50	8.00 – 8.50
Philadelphia district	10.00	8.00 – 9.00
Boston	9.00	8.75 – 9.25
Providence	9.00	8.75

Pacific Export

(Quotations at seaboard, Los Angeles, cargo lots, except where otherwise noted.)

Prices Effective	Feb. 3	Jan. 27
375 e.p. blend, 70 oct.	4.50 – 5.00	4.50 – 5.00
390 e.p. blend, 68 oct.	4.375– 4.625	4.375– 4.625
390 e.p. blend, 66 oct.	4.375– 4.625	4.375– 4.625
400 e.p. blend, 65 oct. min.	4.25 – 4.375	4.25 – 4.375
U. S. Motor, under 65 octane	4.125– 4.25	4.125– 4.25
38-40 grav. w.w. kero., 150 fire point	4.50 – 5.00	4.50 – 5.00
41-43 grav., w.w. kero.	4.75 – 5.00	4.75 – 5.00
44 grav., w.w. kero	5.00 – 5.50	5.00 – 5.50
Diesel fuel, 24 & above	$1.25 –$1.30	$1.25 –$1.30
Diesel fuel, under 24	$1.15 –$1.25	$1.15 –$1.25
30-34 grav. diesel (gas oil) Pac. Spec. 200	$1.25 –$1.35	$1.25 –$1.35
Grade C fuel, Pac. Spec. 400	$0.60 –$0.65	$0.60 –$0.65
In Ship's Bunkers, or deep tank lots:		
Diesel fuel, Pac. Spec. 200	$1.35 –$1.45	$1.35 –$1.45
Grade C fuel, Pac. Spec. 400	$0.65 –$0.75	$0.65 –$0.75

Pacific Export (Cont'd)

Prices Effective	Feb. 3	Jan. 27
Cased Goods: (Per case)		
U. S. M.	$1.35 –$1.45	$1.35 –$1.45
375-400 e.p. blend, 65 oct. & above	$1.50 –$1.60	$1.50 –$1.60
400 e.p. blend, under 65 oct.	$1.40 –$1.50	$1.40 –$1.50
40-43 grav. w.w. kero., 150 fire point	$1.30 –$1.40	$1.30 –$1.40
Kero., p.w.	$1.25 –$1.35	$1.25 –$1.35

Tanker Rates

(Approximate rates. Cents per bbl.)

Gulf-N. Atlantic: (not E. of N.Y.)	Last Paid	Owners Ask
Hvy. Crude & fuel (10 to 19.9 gravity)	66	..
Light Crude, (30 grav. or Lighter)	59	..
Gasoline	55	55
Kerosine	57	57
No. 2 Fuel	60	60

Gulf Coast

(Prices for sales made or firm offers reliably reported for sales pending in cargoes FOB ship at Gulf, for minimum of 20,000 bbls. Prices are by refiners only to other refiners, export agents, or to large tanker terminal operators at the customary trade specifications noted.)

Prices Effective Feb. 3

Motor Gasoline Domestic	
Min. 80 oct. '39 Research, max. 2cc lead	4.25 – 5.25
60-62, Gravity, Max. 400 e.p.	
72-74 oct. leaded (ASTM)	4.00 – 5.00
70 oct. unleaded "	4.25
68 oct. " "	4.25
65 oct. " "	3.875– 4.25
60 oct. " "	3.50 – 4.00
41-43 w.w. kerosine	3.50 – 4.00
No. 2 fuel	3.125– 3.375
Gas Oil—Less than ½ of 1% sulfur.	
Below 43 diesel index	3.125– 3.25
43-47 " "	3.125– 3.25
48-52 " "	3.125– 3.625
53-57 " "	3.50
58 & above diesel index	3.75
Diesel Oil, ships' bunkers (ex-lighterage)	$1.50 –$1.70
Bunker C, " " "	$0.80 –$0.85
Bunker C, cargoes	$0.80 –$0.85
Motor Gasoline Export	
60-62 Gravity, Max. 400 e.p.	
72-74 oct. leaded (ASTM)	4.00 – 5.00
70 oct. unleaded "	4.25
68 oct. " "	4.25
65 oct. " "	3.875– 4.25
60 oct. " "	3.50 – 4.00
61-63 Gravity, Max. 390 e.p.	
72-74 oct. leaded (ASTM)	3.875– 4.25
60 oct. unleaded "	3.50 – 4.00
64-66 Gravity, Max. 375 e.p.	
72-74 oct. leaded (ASTM)	3.875– 4.25
60 oct. unleaded "	3.50 – 4.00
41-43 w.w. kerosine	3.50 – 4.00
Gas Oil—Less than ½ of 1% sulfur.	
Below 43 diesel index	3.125– 3.25
43-47 " "	3.125– 3.25
48-52 " "	3.125– 3.625
53-57 " "	3.50
58 & above diesel index	3.75

MID-CONTINENT LUBES

(At Gulf; in packages, FAS.; in bulk FOB terminals)

Feb. 3

	New Steel Drums	Bulk
200 vis. D. 210 brt. stock	25.50 –25.80 (2)	19.80 (2)
150 vis. D 210 brt. stock 0-10 p.p.	21.50–21.80 (2)	15.80 (2)
10-25 p.p.	21.00 (1)	15.30 (1)
100 vis. D 210 brt. stock 0-10 p.p.	21.00 (1)	15.30 (1)
10-25 p.p.	20.50 (1)	14.80 (1)
200 vis. No. 3 col. neutral: 0-10 p.p.	17.00 (1)	11.30 (1)

SOUTH TEXAS LUBES

(Vis. at 100°, c. t. 0, blk exprt. shp., FOB terminals)

Unfiltered Pale Oils: Vis. Color	Feb. 3	Jan. 27
100 No. 3	6.00	6.00
200 No. 3	7.50	7.50
300 No. 3	8.00	8.00
500 No. 3½	9.00	9.00
750 No. 4	9.50	9.50
1200 No. 4	10.00	10.00
2000 No. 4	10.25	10.25
Red Oils: Vis. Color		
100 No. 5-6	6.00	6.00
200 No. 5-6	7.50	7.50
300 No. 5-6	8.00	8.00
500 No. 5-6	9.00	9.00
750 No. 5-6	9.50	9.50
1200 No. 5-6	10.00	10.00
2000 No. 5-6	10.25	10.25

(c) 0.4c discount generally given for slabs loose.

TANK WAGON PRICES

Commercial or consumer tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include* 1.5c *federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes where levied are indicated in footnotes. Dealer discounts are shown in footnotes; for commercial consumer discounts, see NPN for Feb.* 21, 1941. *These prices in effect Feb.* 3, 1941 *as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

S. O. New Jersey

Esso (*Regular Grade*)

	Consumer Tank Car	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
*Atlantic City, N. J.	6.5	8.1	4.5	7.7
*Newark, N. J.	6.5	8.1	4.5	7.7
Annapolis, Md.	7.35	8.85	5.5	9.5
Baltimore, Md.	6.75	8.25	5.5	8.6
Cumberland, Md.	8.15	9.65	5.5	10
Washington, D. C.	7	8.5	3.5	9.5
Danville, Va.	7.95	10.45	6.5	9
Norfolk, Va.	6.75	9.25	6.5	10.5
Petersburg, Va.	7.05	9.55	6.5	11.2
Richmond, Va.	7.05	9.55	6.5	11
Roanoke, Va.	8.25	10.75	6.5	11
Charleston, W. Va.	7.55	10.05	6.5	11.5
Parkersburg, W. Va.	6.85	9.35	6.5	11.2
Wheeling, W. Va.	7.85	10.35	6.5	11.8
Charlotte, N. C.	8.9	8	7.5	9.8
Hickory, N. C.	9.45	10.95	7.5	9.7
Mt. Airy, N. C.	9.3	8.5	7.5	10.8
Raleigh, N. C.	8.65	8.5	7.5	10.1
Salisbury, N. C.	8.95	7	7.5	10.5
Charleston, S. C.	6.75	9.25	7.5	....
Columbia, S. C.	7.6	10.1	7.5	....
Spartanburg, S. C.	8.3	10.8	7.5	12

	Mineral Spirits T.W.	V.M.&P. T.W.
Newark, N. J.	10.5	14.5
Baltimore, Md.	15	....
Washington, D. C.	15	....

Fuel Oils—T.W.	No. 1	No. 2	No. 3
Atlantic City, N. J.	7.7	6.7	6.7
Newark	7.7	6.5	6.5
Annapolis, Md.	....	....	....
Baltimore	7.6	7	6.5
Washington, D. C.	7.8	7.2	7.2
Norfolk, Va.	7.5	6.5	6.5
Petersburg	7.7	6.7	....
Richmond	7.7	6.7	6.7
Charlotte, N. C.	9.05	8.15	....
Hickory	....	8.4	....
Raleigh	9.25	7.9	....
Charleston, S. C.	....	6.6	....
Columbia	....	7.5	....
Spartanburg	9.8	8	....

*Effective Sept. 19, 1940, minimum retail resale price of 10.4c posted thru New Jersey.

Discounts:

Esso gasoline—to undivided dealers, 0.5c off dealer t.w. price, thru territory, except New Jersey. While above posted prices continue at Atlantic City and Newark, dealers will pay net price of 7.5c per gal. for Esso; dealers having pumps marked only Esso, Esso Extra and Standard White gasoline will pay 7c per gal. for Esso.

Kerosine—1c off t.w. price for 25 gals. or more, under contract thru territory (Baltimore city contract not necessary) except no discount in state of New Jersey.

Naphthas—To buyers taking following quantities at one time: Newark, 2c per gal. on 200 gals. or more, less than 200 gals. 0.5c higher price; Baltimore, 2c off on 25 to 100 gals. and 3c on over 100 gals.; Washington, 2c off to contract buyers.

Socony-Vacuum Oil Co., Inc.

Socony Mobilgas (*Regular Grade*)

	Com. T.C.	Com. Cons. T.W.	Undiv. Dlr. T.W.	Gasoline Taxes
New York City:				
Manhattan & Bronx	7.0	6.7	7.2	*5.5
Kings & Queens	7.0	6.7	7.2	*5.5
Richmond	7.0	6.7	7.2	*5.5
Albany, N. Y.	6.3	6	6.5	5.5
Binghamton, N. Y.	8	8	8.5	5.5
Buffalo, N. Y.	7.5	7.5	8	5.5
Jamestown, N. Y.	7	7.5	8	5.5
Plattsburg, N. Y.	8	7.7	8.2	5.5
Rochester, N. Y.	7.7	7.7	8.2	5.5
Syracuse, N. Y.	7	7	7.2	5.5
Bridgeport, Conn.	5.6	5.3	5.8	4.5
Danbury, Conn.	7.4	7.1	7.6	4.5
Hartford, Conn.	6.8	6.5	7	4.5
New Haven, Conn.	6.6	6.3	6.8	4.5
Bangor, Me.	6.9	6.6	6.3	5.5
Portland, Me.	6.5	6.2	6.3	5.5
Boston, Mass.	6.2	5.9	6.2	4.5
Concord, N. H.	8	7.7	8.2	5.5
Lancaster, N. H.	9	8.7	9.2	5.5
Manchester, N. H.	7.5	6.1	6.6	5.5
Providence, R. I.	6.2	6.2	7.2	4.5
Burlington, Vt.	6.5	6	6.5	5.5
Rutland, Vt.	7.5	7.2	7.7	5.5

	Mineral Spirits T.W.	V.M.&P. T.W.
Buffalo, N. Y.	9.4	10.1
†New York City	8.5	9.2
Rochester, N. Y.	10.2	10.9
Syracuse, N. Y.	11.1	11.8
Boston, Mass.	11	11
Bridgeport, Conn.	11.5	12
Hartford, Conn.	11	11.5
Providence, R. I.	11	12

	Kerosine Yard	Kerosine T.W.	Mobilfuel Diesel TC	Mobilfuel Diesel TW	Mobilheat Fuel Yard	Mobilheat Fuel TW
ew York:						
Manhat'n & Bronx	....	7.8	....	7	....	6.3
Kings & Queens	5.3	7.8	....	7	5	6.3
Richmond	4.8	8	....	7	4.8	6.6
Albany	5.7	7.8	5.2	7.2	5.1	6.8
Binghamton	7	9	....	....	6.3	7.8
Buffalo	6.3	8.1	5.8	7.8	5.9	7.4
Jamestown	5.9	8	....	....	5.9	7
Plattsburg	6.3	8.3	....	....	5.7	7.2
Rochester	6.8	8.9	....	....	6.1	7.4
Syracuse	6.8	8.8	....	....	6.2	7.7
Conn:						
Bridgeport	5.6	7.8	....	....	4.9	6.2
Danbury	6.1	8.0	....	....	5.4	6.5
Hartford	5.6	7.5	....	7.6	5.1	6.9
New Haven	5.3	7.4	....	....	4.7	6.5
Maine:						
Bangor	6	8	....	....	5.5	7
Portland	5.8	8	5.5	7.5	5.3	6.8
Mass.:						
Boston	5.7	8	5.4	7.4	5.2	6.8
N. H.:						
Concord	6.5	8.5	....	....	6.3	7.8
Lancaster	7.6	9.6	....	....	7.3	8.8
Manchester	6.9	8.9	....	....	6	7.5
R. I.:						
Providence	5.7	8	5.4	7.4	5.2	6.7
Vermont:						
Burlington	6.3	8.3	....	....	5.6	7
Rutland	6.5	8.5	....	....	5.8	7.3

*Plus 2% city sales tax computed at time of each sale.

†Prices apply to consumers only in quantities over 1000 gals. annually; for quantities under 1000 gals. annually, add 0.5c per gal.

Discounts: Gasoline—To undivided dealers, 0.5c less than divided dealer t.w. Diesel—On t.w. deliveries, 0.5c for at least 400 gals.; 1c for full tank truck.

Atlantic Refining

Atlantic White Flash Gasoline (*Regular Grade*)

	Commercial T.C.	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
Philadelphia, Pa.	7	8	5.5	10
Pittsburgh	7.5	9.5	5.5	10.5
Allentown	7.5	9	5.5	10.5
Erie	7	9.5	5.5	10
Scranton	7.5	9	5.5	10.5
Altoona	7.5	9.5	5.5	10.5
Emporium	7.5	9.5	5.5	10.5
Indiana	7.5	9.5	5.5	10.5
Uniontown	7.5	9.5	5.5	10.5
Harriaburg	7.5	9	5.5	10.5
Williamsport	7.5	9	5.5	10
Dover, Del.	....	8.5	5.5	10.5
Wilmington, Del.	....	8	5.5	10
Boston, Mass.	....	6.7	4.5	8.1
Springfield, Mass.	....	6.8	4.5	9.1
Worcester, Mass.	....	7.5	4.5	8
Fall River, Mass.	....	7.7	4.5	8.3
Hartford, Conn.	....	7.5	4.5	8.6
New Haven, Conn.	....	7.3	4.5	8.6
Providence, R. I.	....	7.7	4.5	8.3
Atlantic City, N. J.	....	7.5	4.5	7.7
Camden, N. J.	....	7.5	4.5	7.7
Trenton, N. J.	....	7.3	4.5	7.7
Annapolis, Md.	....	8.85	5.5	9.6
Baltimore, Md.	....	8.25	5.5	8.6
Hagerstown, Md.	....	9.35	5.5	10
Richmond, Va.	....	9.55	6.5	11
Wilmington, N. C.	....	9.35	7.5	9.4
Brunswick, Ga.	....	7.5	7.5	*9
Jacksonville, Fla.	....	7.5	8.5	10

	Mineral Spirits T.W.†	V.M.&P. T.W.†
Philadelphia, Pa.	12	14.5
Lancaster, Pa.	13.5	16
Pittsburgh, Pa.	14.5	14.5

Fuel Oils—T.W.	1	2	3	5	6
Phila., Pa.	8	6.75	6.75	4.25	3.50
Allentown, Pa.	8.5	7	7	....	....
Wilmington, Del.	8.00	6.75	6.75	....	....
Springfield, Mass.	9.1	7	7	....	....
Worcester, Mass.	8	7	7	....	....
Hartford, Conn.	8.6	6.9	6.9	....	....

*Does not include 1c Georgia kerosine tax.

†Mineral Spirits prices also apply to Stoddard Solvent; V.M.&P. prices also apply to Light Cleaners Naphtha.

Discounts:

Gasoline—to undivided dealers, 0.5c off dealer t.w., except Georgia & Florida dealer t.w. and undivided dealer t.w. prices are same.

Kerosine—Thru Penna. & Delaware, 2c off t.w. price on t.w. deliveries of 25 gals. or more at one time.

Naphthas—Philadelphia, 200 gals. or more at one time, 2c off, Lancaster, contract buyers taking 1000 gals. or more per year, one drum up, 2c off; non-contract buyers, 200 gals. or more at one time, 2c off. Pittsburgh, 500 gals. or more at one time, 2c off.

S. O. Ohio††

	Consumer T.W.	**Reselers	Gasoline Taxes	‡S.S.	†Kerosine T.W
	*Sohio X-70 Gasoline (*Regular Grade*)				
Ohio, Statewide	10.5	9	5.5	12.5	8
Akron	10.5	7.5	5.5	9.5	8
Cincinnati	10.5	7.5	5.5	10	8
Cleveland	10.5	8	5.5	11	8
Columbus	10.5	8	5.5	11	8
Dayton	10.5	7	5.5	9.5	8
Marietta	10.5	8	5.5	10.5	8
Portsmouth	10.5	8.5	5.5	11.5	8
Toledo	10.5	7.5	5.5	10	8
Youngstown	10.5	8	5.5	11	7.5

Aviation Gasoline—Statewide

	Consumer T.W.	Gasoline Taxes
Sohio Aviation	14.5	5.5
Esso Ethyl Aviation 74 Oct.	15.5	5.5
Esso Ethyl Aviation 80 Oct.	16.5	5.5
Esso Ethyl Aviation 87 Oct.	17.5	5.5
Esso Ethyl Aviation 90 Oct.	17.5	5.5
Esso Ethyl Aviation 100 Oct.	24.5	5.5

	†Naphthas—T.W. Statewide	Lucas County
S.R. Solvent	12.75	12.75
D.C. Naphtha	13.25	13
V.M.&P. Naphtha	13.25	13
Varnolene	13.25	13
Sohio Solvent	13.25	13

Fuel Oils—T.W.	No. 1	No. 2	No. 3	No. 4
Ohio, Statewide	8.0	8.0	7.5	....
Toledo	7.5	7.5	7.0	....
Cleveland	9.5	9.5	9.0	6.75

*Renown (third-grade) prices are same as X-70 unless otherwise noted.

**Except authorized agents.

†Kerosine prices are ex 1c state tax. Naphtha prices are ex 1.5c federal & 4c state tax.

‡Prices at company-operated stations.

††Statewide prices are subject to exceptions other than those shown.

Discounts:

Esso aviation—on contract to hangar operators and resellers, 2c off consumer t.w.

Fuel Oils—Statewide and Toledo prices are for t.w. deliveries of less than 50 gals.; t.w. and drum deliveries of over 50 gals. are 0.5c less. Cleveland Nos. 1, 2, and 3 prices are for bulk deliveries of 5 to 99 gals.; 100 gals. and over are 2c less. Cleveland No. 4 price is for full compartment hose dump only.

Naphthas—to contract consumers off t.w. prices—Statewide: 300 to 999 gals., 0.5c; 1000 to 2499 gals., 0.75c; 2500 to 4999 gals., 1c; 5000 or more gals., 1.5c. Lucas County: Less than 50 gals., tank wagon price; 50 to 249 gals., 0.5c; 250 to 499 gals., 1c; 500 gals. or over, 1.5c.

S. O. Kentucky

Crown Gasoline (*Regular*)

Standard (*Third Grade*)

	†Net Dealer Crown	Standard	Gasoline Taxes	Kerosine T.W.
Covington, Ky.	7	6.5	6.5	9
Lexington, Ky.	9	7	6.5	9
Louisville, Ky.	8.5	6.5	6.5	8.5
Paducah, Ky.	7	6	6.5	8.5
Jackson, Miss.	7.5	6.5	7.5	*8.5
Vicksburg, Miss.	8	7	7.5	*8
Birmingham, Ala.	8	7	*8.5	8
Mobile, Ala.	6	5	*9.5	8
Montgomery, Ala.	8.5	7.5	*9.5	*9
Atlanta, Ga.	7.5	6.5	7.5	*8
Augusta, Ga.	8	7	7.5	*8.5
Macon, Ga.	7.5	6.5	7.5	*8
Savannah Ga.	8	7	7.5	*8
Jacksonville, Fla.	7.5	6.5	8.5	8
Miami, Fla.	7.5	6.5	8.5	8
Pensacola, Fla.	7.5	6.5	*9.5	8
Tampa, Fla.	7.5	6.5	8.5	8

*Taxes: In tax column are included these city and county gasoline taxes: Mobile, 2c city; Birmingham 1c city; Montgomery, 1c city and 1c county; Pensacola, 1c city. Georgia and Montgomery, Ala. have 1c kerosine tax, Mississippi 0.5c, not included in above prices.

†Consumer t.w. prices are same as net dealer prices.

S. O. Indiana

Red Crown (*Regular Grade*)

Stanolind (*Third Grade*)

	Red Crown Cons. T.W.	Dealer Prices Red Crown	Stanolind	Gasoline Taxes	Kerosine T.W.
Chicago, Ill.	10.1	8.1	6.4	4.5	10
Decatur, Ill.	10.1	8.6	6.2	4.5	10
Joliet, Ill.	11.1	9.6	6.7	4.5	10
Peoria, Ill.	11.1	8.7	8.1	4.5	10
Quincy, Ill.	10.9	9.4	8.1	4.5	9.8
Indianapolis, Ind.	11.3	9.3	8.9	5.5	*10
Evansville, Ind.	11.1	9.6	8	5.5	*9.8

(Continued on next page)

TANK WAGON PRICES

Commercial or consumer tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes:** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include 1.5c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes where levied are indicated in footnotes. Dealer discounts are shown in footnotes; for commercial consumer discounts, see NPN for Feb. 21, 1940.*

These prices in effect Feb. 3, 1941 as posted by principal marketing companies at their headquarters offices, but subject to later correction.

S. O. Indiana (Cont'd)

Red Crown (*Regular Grade*)
Stanolind (*Third Grade*)

	Red Crown Cons. T.W.	Dealer Prices Red Crown	Stanolind	Gasoline Taxes	Kerosine T.W.
South Bend, Ind.	11.5	9.8	8.8	5.5	*10
Detroit, Mich.	9.6	8.1	7.1	4.5	8.1
Grand Rapids, Mich.	10.3	8.8	8.4	4.5	9.1
Saginaw, Mich.	10.4	8.9	8.4	4.5	9.1
Green Bay, Wis.	11.9	10.4	8.9	5.5	10.8
Milwaukee, Wis.	11.3	9.8	9.3	5.5	10.2
La Crosse, Wis.	11.5	10	9.5	5.5	10.4
Minneapolis-St. Paul	11.5	9.7	7.3	4.5	10.4
Duluth, Minn.	11.9	10.4	9.9	4.5	10.8
Mankato, Minn.	11.5	10	8.5	4.5	9.5
Des Moines, Ia.	10.9	9.4	7.9	4.5	*9.8
Davenport, Ia.	11.1	9.6	9.1	4.5	*10
Mason City, Ia.	11.3	9.8	6.9	4.5	*10.2
St. Louis, Mo.	10.2	8.7	7	*4.5	9.6
Kansas City, Mo.	10.4	7.4	6.4	*4.5	8.6
St. Joseph, Mo.	10.4	8.5	7.5	*4.5	8.4
Fargo, N. D.	12.7	11.2	9	5.5	11.6
Huron, S. D.	12	10.5	10	5.5	10.9
Wichita, Kans.	9.3	7.8	5.5	4.5	7.2

	Stanavo Aviation 73 Octane
Chicago, Ill.	14.9
Detroit, Mich.	16.5
Milwaukee, Wis.	15.1
Minneapolis, Minn.	15.3
St. Louis, Mo.	14.5
Kansas City, Mo.	14.1
Fargo, N. D.	16.5
Huron, S. D.	15.8

	Oleum Spirits	V.M.&P. Naphtha	Stanisol	*Taxes
	(Prices are base prices before discounts)			
Chicago	12.7	13	12.4	4.5
Detroit	15.2	14.2	15.7	4.5
K. C., Mo.	12.8	13.8	13.3	1.5
St. Louis	13.2	14.2	12.4	1.5
Milwaukee	13.8	14.8	14.3	5.5
Minneap'lis	14	15	12.7	4.5

	Fuel Oils T.W. Standard Heater Oil Chicago:
1-99 gals.	9
100-149 gals.	8
150 gals. & over	7.5

	Stanolex No. 1	Stanolex Furnace Oil
1-99 gals.	8.5	8.5
100-399 gals.	7.5	7.5
400 gals. & over	7	7

	Stanolex Fuel Oil A	Stanolex Fuel Oil B
1-399 gals.	6	6
400-799 gals.	5	5
800 gals. & over	4.75	4.75

	Stanolex Bunker C Fuel Oil
1-999 gals.	4.75
1000 gals. & over	3.75

Other Points:	Stanolex No. 1	Stanolex Furnace Oil
Indianapolis		
1-99 gals.		*8.5
100 gals. & over		*7.5
Detroit		
1-99 gals.		7.6
100 gals. & over		6.6
Milwaukee		
1-99 gals.	9.2	8.7
100 gals. & over	8.2	7.7
Minneapolis		
1-99 gals.	8.5	8.5
100 gals. & over		7.5
100-199 gals.	8	
200 gals. & over	7.5	
St. Louis		
1-99 gals	8	7.5
100 gals. & over	7	6.5
Kansas City		
1-49 gals.	7.8	
50 gals. & over	6.8	
1-99 gals.		7.8
100 gals. & over		6.8

*Taxes: In gasoline tax column are included these city taxes—Kansas City, St. Joseph, and St. Louis, 1c. Indiana kerosine and fuel oil prices are ex 4c state tax; Iowa kerosine prices are ex 3c state tax. In naphtha tax column are included 1.5c federal tax and state taxes.

†Prices for small-lot deliveries range up to 2c higher than above prices.

S. O. Nebraska

Standard Red Crown Gasoline
(Regular Grade)

	T.W. Dealer	Gasoline Taxes	Kerosine T.W.
Omaha	10.9	9.4	6.5	9.8
McCook	11	7.9	6.5	9.5
Norfolk	11	9.4	6.5	9.9
North Platte	11.3	9.5	6.5	10.2
Scottsbluff	11.4	8.5	6.5	10.8

S. O. Louisiana

Esso Gasoline (*Regular Grade*)

	Consumer Tank Car	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
New Orleans, La.	5.75	8.25	8.5	*9
Baton Rouge, La.	6.25	8.75	8.5	*9.5
Alexandria, La.	6.25	8.75	8.5	*9.5
Lafayette, La.	6.5	9	8.5	*9
Lake Charles, La.	6.25	8.75	8.5	*9
Shreveport, La.	5.5	8	8.5	*9
Knoxville, Tenn.	9.5	11.5	8.5	12.5
Memphis, Tenn.	7.5	9.5	8.5	11
Chattanooga, Tenn.	9	8.85	8.5	12
Nashville, Tenn.	8.5	9	8.5	11
Bristol, Tenn.	9.75	10.25	8.5	12
Little Rock, Ark.	6.75	8.5	8	10

*Louisiana kerosine prices are ex 1c state tax.

Discounts:

Esso Gasoline—To individed dealers, 0.5c off dealer t.w.

Humble Oil & Refining Co.

Humble Motor Fuel (Regular Grade)
Thriftane (*Third Grade*)

	Humble *Tank Wagon Retail	Thriftane *Tank Wagon	Thriftane Retail	Gasoline Taxes
Dallas, Tex.	6 10	5	8	5.5
Ft. Worth, Tex.	6 10	5	8	5.5
Houston, Tex.	7 11	5	8	5.5
San Antonio, Tex.	7 11	5	8	5.5

	Kerosine *Tank Wagon	Kerosine Retail
Dallas, Tex.	6	10
Ft. Worth, Tex.	7	11
Houston, Tex.	8	11
San Antonio, Tex.	7	11

	74 Oct. Aviation Gasoline, Clear Tank Car
FOB Baytown, Tex.	8.5

*To all classes of dealers & consumers.

The Texas Co.

	Gasoline—Dealer T.W. Fire-Chief (*Regular*)	Indian (*3rd Grade*)	Gasoline Taxes
Dallas, Tex.	6	5	5.5
Ft. Worth, Tex.	5	5	5.5
Wichita Falls, Tex.	7	5	5.5
Amarillo, Tex.	7	5	5.5
Tyler, Tex.	7	5	5.5
El Paso, Tex.	9	8	5.5
San Angelo, Tex.	7	5	5.5
Waco, Tex.	6.5	4.5	5.5
Austin, Tex.	7	5	5.5
Houston, Tex.	7	5	5.5
San Antonio, Tex.	7	5	5.5
Port Arthur, Tex.	7	5	5.5

Continental Oil

	Conoco Bronz-z-z (*Regular*) †Tank Wagon	Demand (*3rd Grade*)	Gasoline Taxes	Kerosine T.W.
Denver, Col.	9	8	5.5	10.5
Grand Junction, Col.	11	10	5.5	12
Pueblo, Col.	10	8	5.5	9
Casper, Wyo.	11	10	5.5	11.5
Cheyenne, Wyo.	6.5	5.5	5.5	11
Billings, Mont.	10	9	6.5	12
Butte, Mont.	9	8	6.5	13
Great Falls, Mont.	9	8	6.5	12
Helena, Mont.	9	8	6.5	12.5
Salt Lake City, Utah	10.5	9.5	5.5	14
Boise, Ida.	*12.1	*11.1	6.5	16
Twin Falls, Ida.	*13.1	*12.1	6.5	16.5
Albuquerque, N. M.	9	8	*7	9.5
Roswell, N. M.	7	6	*7	8
Santa Fe, N. M.	9.5	8.5	*7.5	9.5
Ft. Smith, Ark.	8	5.75	*5.5	6.5
Little Rock, Ark.	8	5.5	8	8
Texarkana, Ark.	8	6	*5.5	6
Muskogee, Okla.	8	7	5.5	7
Oklahoma City, Okla.	6	5.5	5.5	6.5
Tulsa, Okla.	7	6	5.5	6

Conoco Special Gasoline (Aviation)

	T.W.	Gasoline Taxes
Denver, Colo.	13.5	5.5
Cheyenne, Wyo.	13.5	5.5
Helena, Mont.	15.5	6.5
Salt Lake City, Utah	18	5.5
Albuquerque, N. M.	14	*7

*Taxes: In gasoline tax column are included these city taxes—Albuquerque, & Roswell, 0.5c; Santa Fe, 1c. Idaho prices include 1 mill tax for toll bridges. Texas 4c state tax applies within city limits of Texarkana, Ark.; Okla. 4c state tax applies within city limits of Ft. Smith, Ark.

†To consumers and dealers, except at Cheyenne where consumer t.w. prices are 2.5c above dealer t.w. prices shown above, and Oklahoma City where consumer t.w. prices are 1c and 0.5c above Bronz-z-z and Demand dealer t.w. prices, respectively, shown above.

S. O. California

Standard Gasoline (*Regular Grade*)
Flight Gasoline (*Third Grade*)

	Standard Tank Truck	Standard Retail	Flight Tank Truck	Flight Retail	Gasoline Taxes
San Francisco, Cal.	12	13	10	11	4.5
Los Angeles, Cal.	11.5	12.5	9.5	10.5	4.5
Fresno, Cal.	13	14	11	12	4.5
Phoenix, Ariz.	14	15	11	12	6.5
Reno, Nev.	14	15	12	13	5.5
Portland, Ore.	12.5	13.5	10.5	11.5	6.5
Seattle, Wash.	12.5	13.5	10.5	11.5	6.5
Spokane, Wash.	14	15	12	13	6.5
Tacoma, Wash.	12.5	13.5	10.5	11.5	6.5

	Stanavo Tank Truck	Aviation Gasoline	Kerosine Tank Truck
San Francisco, Cal.	15.5	4.5	11.5
Los Angeles, Cal.	15	4.5	10
Fresno, Cal.	16.5	4.5	12.5
Phoenix, Ariz.	17.5	6.5	*12.5
Reno, Nev.	17.5	5.5	13.5
Portland, Ore.	16	6.5	13.5
Seattle, Wash.	16	6.5	13.5
Spokane, Wash.	19	6.5	16.5
Tacoma, Wash.	16	6.5	13.5

*Taxes: Phoenix kerosine price is ex 5c state tax.

Discounts:

To Resale & Commercial Consumers—3c off posted tank truck tax included price on Standard & Stanavo Aviation, 2c off on Flight. Deliveries less than 40 gals. to commercial consumer trade, 1c a gal. above posted tank truck tax included price, except single deliveries to Marine trade only which are billed at posted tank truck tax included price less 3c for Standard & Stanavo Aviation, and less 2c for Flight.

Kerosine—Tank car and truck & trailer deliveries, 3c off posted tank truck price; plant stem deliveries to jobbers, 2.5c off posted tank truck price.

Canada

PRICES OF IMPERIAL OIL LTD.
Per Imperial Gallon, which is 1.2 U. S. Gallons
3-Star Imperial Gasoline (*Regular Grade*)

	Gasoline T.W.	Gasoline Taxes	Kerosine T.W.
Hamilton, Ont.	16.5	8	17
Toronto, Ont.	16.5	8	17
Brandon, Man.	21	7	23
Winnipeg, Man.	20.5	7	22.5
Regina, Sask.	18	7	20
Saskatoon, Sask.	21	7	23
Edmonton, Alta.	18.9	7	20.9
Calgary, Alta.	16	7	18
Vancouver, B. C.	16	7	23
Montreal, Que.	16	8	16.5
St. John, N. B.	14.50	10	18
Halifax, N. S.	14.50	10	18

Discounts: Gasoline—Maritime Provinces—undivided & divided dealers, t.w. price; British Columbia—undivided and divided dealers, 2c off t.w. price; balance of territory—undivided dealers, 1c off t.w. price, divided dealers, t.w. price.

PRICE CHANGES

(These changes have been made in price tables)

S. O. New Jersey—Esso Gasoline:
Charlotte t. w. up 1c Jan. 28.

S. O. New Jersey—Kerosine:
Atlantic City & Newark cut 0.2c Jan. 28.
Charlotte cut 0.25c Dec. 31.
Other North Carolina points cut 0.15c generally Jan. 20.

Socony-Vacuum—Mobilgas:
New York City t. c. & t. w. prices up 0.2c Jan. 29.
Jamestown t. c. up 0.3c, consumer t. w. up 0.2c, & dealer t. w. up 0.9c Jan. 23.

Socony-Vacuum—Kerosine:
Manhattan & Bronx t. w. cut 0.2c Jan. 27.
Kings & Queens yard & t. w. cut 0.2c Jan. 27.
Bridgeport yard cut 0.2c Jan. 28.
Danbury yard cut 0.2c, t. w. 0.3c Jan. 28.
Hartford yard cut 0.1c Jan. 30.
New Haven yard cut 0.4c, t. w. 0.3c Jan. 30.

Atlantic Refining—White Flash Gasoline:
Fall River & Providence t. w. up 0.2c Jan. 24.

Atlantic Refining—Kerosine:
Atlantic City, Camden & Trenton cut 0.2c Jan. 24.
Wilmington, N. C. cut 0.15c Jan. 24.

S. O. Indiana—Red Crown:
Grand Rapids t. w. & dealer up 0.5c Feb. 3.

S. O. Indiana—Stanolind:
Grand Rapids dealer up 0.4c Feb. 3.
Davenport dealer up 1c Jan. 29.

S. O. Nebraska—Red Crown Gasoline:
McCook & Scottsbluff t. w. & dealer, Norfolk & North Platte dealer, all up 0.5c Jan. 25.

Continental Oil—Bronz-z-z & Demand:
Oklahoma City dealer t. w. prices cut 1c & 0.5c, respectively, Jan. 31.

CRUDE OIL PRICES

Prices in $ per bbl. of 42 U. S. gals. at the well. A. P. I. gravity. Prices are effective as of 7 a. m. of dates as given

EASTERN & CENTRAL STATES FIELDS

PENNSYLVANIA GRADE

Posted by Jos. Seep Purch. Agency (Jan. 27, '41)

Bradford-Allegany $2.30
Southwest Penna $1.95
Eureka (West Va.) $1.89
Corning, O. (Nov. 1, 1939) $1.12

Posted by Tide Water Assoc. Oil Co. (Jan. 27, '41)

Bradford-Allegany $2.30

Posted by The Pennzoil Co., (Jan. 27, '41)

National Transit $2.23*

Posted by Valvoline Pipe Lines (Jan. 27, 1941)

Bradford (Elk & McKean Counties, Pa.) $2.30
Warren, Forest, Venango, Clarion & Butler Counties, Pa. $2.23
Allegheny, Beaver, Washington & Greene Counties, Pa. $1.95
West Virginia $1.89
South Eastern Ohio $1.85

*Applies to Cochran, Franklin, Hamilton & Doolittle districts; prices in other lower districts range down to $2.18 per bbl. at well.

MICHIGAN

Posted by Pure Oil Co. (Jan. 2, '41)

Midland, Midland County $1.22
Sherman, Clare-Freeman $1.17

Posted by Simrall Corp. (Jan. 2, '41)

Greendale, Porter, Vernon, Crystal & Wise $1.22
Buckeye, Bentley, Edenville, Beaverton & sweet crude type of Monitor $1.20
Freeman, Redding & Lincoln $1.17
West Branch-Arenac $1.02
Hamilton-Grout $1.07

Posted by Sohio Corp. (Michigan Division)

Traverse Crude in Allegan, Kent & Ottawa Cos., Bloomingdale & Columbia Twps. in Van Buren Co. (Jan. 16, '41) $1.23
Trenton Crude in Monroe Co. (Jan. 16, '41) $1.17

Posted by Bay Pipe Line Corp. (Jan. 2, '41)

Saginaw & Wise $1.22 — Buckeye & Bentley $1.20
Clare $0.91 — Adams $1.05
Bay Distillate $1.48

ILLINOIS-INDIANA-KENTUCKY

Posted by Sohio Corp.

Illinois Basin, including Griffin pool (Aug. 21, '40) $1.15
Carmi, Storms, Ill. area (Feb. 1, '41) 1.10
Birk City, Ky. area (Jan. 1, '41) 1.10
Corydon, Ky. area, Henderson (Jan. 1, '41) 1.10

Posted by Ohio Oil Co.

Illinois Basin (Aug. 21, '40) $1.15
Illinois & Western Indiana (Aug. 23, '40) 1.00

Posted by Carter Oil Co. (Aug. 21, '40)

Louden, Fayette Co. Ill. $1.15

Posted by Mohawk Oil Lines, Inc. (Aug. 21, '40)

So. Illinois heavy $1.05 — Light $1.15

Posted by Ashland Oil & Transp. Co. Somerset oil in Ashland Lines, Ky.: (Aug. 21, '40)

Big Sandy River $1.12 — Kentucky River $1.20

Posted by Owensboro-Ashland Co.

Owensboro, Ky. area (Aug. 21, '40) $1.10

MID-CONTINENT

OKLAHOMA-KANSAS-NORTH TEXAS

(See below for companies posting and effective dates)

Gravity	Schedule No. 1	Schedule No. 2	Schedule No. 3	Schedule No. 4	Schedule No. 5
Below 21	$0.70	$0.60	....	....	$0.63
21-21.9	.72	.63	....	....	.65
22-22.9	.74	.66	....	....	.67
23-23.9	.76	.69	....	....	.69
24-24.9	.78	.72	....	....	.71
25-25.9	.80	.75	....	$0.58	.73
26-26.9	.82	.78	....	.63	.75
27-27.9	.84	.81	....	.68	.77
28-28.9	.86	.84	$0.86	.73	.79
29-29.9	.88	.87	.88	.78	.81
30-30.9	.90	.90	.90	.82	.83
31-31.9	.92	.92	.92	.86	.85
32-32.9	.94	.94	.94	.90	.87
33-33.9	.96	.96	.96	.96	.89
34-34.9	.98	.98	.98	.98	.91
35-35.9	1.00	1.00	1.00	1.00	.93
36-36.9	1.02	1.02	1.02	1.02	.95
37-37.9	1.04	1.04	1.04	1.04	.97
38-38.9	1.06	1.06	1.06	1.06	.99
39-39.9	1.08	1.08	1.08	1.08	1.01
40 & above	1.10	1.10	1.10	1.10	1.03

Above schedules posted by:

No. 1: S. O. Indiana Oct. 17, '38 in Okla. & Kans.
No. 2: Carter Oct. 13, '38 in Okla.; Magnolia Oct. 12, '38 in Okla.; Shell Oct. 22, '38 in Okla. & Kans.
No. 3: Continental Oct. 11, '38 in Okla. & Kans. with lowest grade Below 29; Texas Co. Oct. 12, '38 in Okla. & Kans.
No. 4: Sinclair-Prairie Aug. 31, '39 in Okla. & Kans.
No. 5: Stanolind Sept. 1, '40 in N. Texas; Continental Oct. 11, '38 in N. Texas; Texas Co. Oct. 12, '38 in N. & N. Central Texas; Magnolia Dec. 3, '38 in N. & N. Central Texas; Sinclair-Prairie July 16, '40 in Mexia & N. Central Texas. Texas Co.'s lowest grade is 28-28.9 at $0.79; Continental, Magnolia and Sinclair-Prairie postings begin with Below 29 at $0.79.

TEXAS & NEW MEXICO FIELDS

Posted by Humble Oil & Refining Co. (Oct. 2, '39)

Gravity	West Central Texas	East Central Texas	Gray County	Carson & Hutchinson Counties	Tomball, Etc.	West Texas & New Mexico	Texas Gulf Coast & Mirando	Anahuac-Dickinson	Refugio
Below 20	....	....	....	....	....	$0.53	$0.86	$0.81	$0.91
20-20.9	....	....	....	....	....	.55	.88	.83	.93
21-21.9	....	....	....	....	....	.57	.90	.85	.95
22-22.9	....	....	....	....	$0.95	.59	.92	.87	.97
23-23.9	....	$0.78	....	....	.97	.61	.94	.89	.99
24-24.9	$0.71	.80	....	....	.99	.63	.96	.91	1.01
25-25.9	.73	.82	....	....	1.01	.65	.98	.93	1.03
26-26.9	.75	.84	....	....	1.03	.67	1.00	.95	1.05
27-27.9	.77	.86	....	....	1.05	.69	1.02	.97	1.07
28-28.9	.79	.88	$0.72	$0.67	1.07	.71	1.04	.99	1.09
29-29.9	.81	.90	.74	.69	1.09	.73	1.06	1.01	1.11
30-30.9	.83	.92	.76	.71	1.11	.75	1.08	1.03	1.13
31-31.9	.85	.94	.78	.73	1.13	.77	1.10	1.05	1.15
32-32.9	.87	.96	.80	.75	1.15	.79	1.12	1.07	1.17
33-33.9	.89	.98	.82	.77	1.17	.81	1.14	1.09	1.19
34-34.9	.91	1.00	.84	.79	1.19	.83	1.16	1.11	1.21
35-35.9	.93	1.02	.86	.81	1.21	.85	1.18	1.13	1.23
36-36.9	.95	1.04	.88	.83	1.23	.87	1.20	1.15	1.25
37-37.9	.97	1.06	.90	.85	1.25	.89	1.22	1.17	1.27
38-38.9	.99	1.08	.92	.87	1.27	.91	1.24	1.19	1.29
39-39.9	1.01	1.10	.94	.89	1.29	.93	1.26	1.21	1.31
40 & above	1.03	1.12	.96	.91	1.31	.95	1.28	1.23	1.33

W. Central Tex. includes crudes purchased in Brown, Callahan, Coleman, Comanche, Eastland, Fisher, Haskell, Jones, Shackelford, Stephens, Throckmorton & Young Cos., Tex.

E. Central Tex. includes crudes purchased in Anderson, Cherokee, Limestone & Navarro Cos., Tex.

W. Tex. & N. Mex. includes crudes purchased in Andrews, Crane, Crockett, Ector, Gaines, Glasscock, Howard, Reagan, Upton, Winkler & Yoakum Cos., Tex. & Lea Co., N. Mex.

Tex. Gulf Coast includes crudes purchased in Goose Creek, Sugarland, Thompsons, Mykawa, Amelia, Webster & Clear Lake fields.

Anahuac-Dickinson includes crudes purchased in Gillock, Cedar Point, Fairbanks, Turtle Bay, Hull, Pierce Junction & Raccoon Bend (Shallow Sand) fields.

Refugio includes crudes purchased in Saxet, East White Point, Greta, O'Connor-McFadden, Taft, Plymouth & Tom O'Connor fields.

Mirando includes crudes purchased in Duval, Jim Hogg, Webb & Zapata Cos., Tex. & in Heyser & Placedo fields.

Postings for Raccoon Bend (Deep Sand) & Satsuma crudes are same as for Tomball.

East Texas $1.10
Van ..... .93
Pecos ..... .78
Talco $0.65
Conroe 1.27
Hardin 1.10
Flour Bluff & Jim Wells Cos. $1.23
Salt Flat, Darst Creek, Hilbig, Carroll, Clark & Zoboroski ..... .96

MAGNOLIA PETROLEUM CO.

Gray, Carson & Hutchinson Cos., Tex.—Dec. 3, '38—same as Humble.

Tomball, Tex.—Dec. 3, '38—same as Humble.

West Texas—Oct. 12, '38, in Crane, Glasscock, Howard, Mitchell, Upton & Winkler Cos. and Dec. 6, '40 in Cochran, Hockley, Yoakum & Gaines Cos.—same as Humble except Magnolia begins with Below 25 at $0.63.

N. Mexico—Oct. 15, '39, in Lea Co.—same as Humble except Magnolia begins with Below 25 at $0.63 and ends with 36 & above at $0.87.

Mirando, Tex.—Oct. 2, '39—same as Humble.

Beaumont, Tex.—Oct. 2, '39—same as Humble Texas Gulf Coast.

Cass & Panola Cos., Tex.—Oct. 12, '38—Below 25 grav. oil at $0.73, plus 2c per degree of gravity to top of 40 & above at $1.05.

Following Tex. postings Oct. 12, '38:

East Texas $1.10
Darst Creek ..... .96
Luling ..... .87
Lytton Springs ..... .99
Cleveland (Liberty Co.) $1.14
Hardin (Liberty Co.) 1.02

SINCLAIR-PRAIRIE OIL MARKETING CO.

Gray, Carson & Hutchinson Cos., Tex.—Aug. 31, '39—same as Humble.

West Texas & Lea Co., N. Mex.—Aug. 31, '39—same as Humble, except Sinclair begins with Below 25 at $0.63 and ends with 36 & above at $0.87.

Texas Gulf Coast—Oct. 3, '39—same as Humble.

East Texas (Oct. 2, '39) $1.10
Eddy Co., N. Mex. (Aug. 31, '39) ..... .77
Long Lake, in Anderson, Leon & Freestone Cos., Tex. (Jan. 20, '40) $1.08

STANOLIND OIL PURCHASING CO.

Tomball, Tex.—Aug. 29, '39—same as Humble except Stanolind begins with Below 29 at $1.07.

Texas Gulf Coast—Oct. 3, '39, in Clinton field—same as Humble Texas Gulf Coast except Stanolind begins with Below 21 at $0.88.

STANOLIND OIL & GAS CO.

West Beaumont, Jefferson Co., Tex.—Oct. 2, '39—same as Humble Texas Gulf Coast.

THE TEXAS CO.

(Effective Oct. 2, '39)

Panhandle, Tex.—Sweet crude same as Humble's Gray Co. except Texaco begins with 34-34.9 at $0.84. Sour crude same as Humble's Carson & Hutchinson Cos. except Texaco begins with 34-34.9 at $0.79.

West Texas & Lea Co., N. Mex.—Same as Humble except Texaco begins with Below 26 at $0.65 and ends with 36 & above at $0.87.

Texas Gulf Coast—Same as Humble except Texaco ends with 34 & above at $1.16.

Mirando-Duval, Tex.—Same as Humble except Texaco ends with 28 & above at $1.04.

Refugio, Tex.—Same as Humble except Texaco ends with 28 & above at $1.09.

Following Tex. postings Oct. 2, '39:

East Texas $1.10
Darst Creek ..... .96
Cass Co. $1.05
Conroe 1.27

SHELL OIL CO., INC.

West Texas & Lea Co., N. Mex.—Aug. 29, '39, & Yoakum Co., Tex. Sept. 1, '39—same as Humble except Shell ends with 36 & above at $0.87.

Fisher Co., Tex.—Aug. 29, '39—Below 25 grav. at $0.68, plus 2c per degree of gravity up to 40 & above at $1.00.

Following Tex. postings Oct. 5, '39:
East Texas $1.10
Livingston area, Polk Co. 1.10

Following Tex. postings Aug. 29, '39:
Pecos Co., except Yates Shallow pool $0.78
Pecos Co., Yates Shallow pool ..... .65

CONTINENTAL OIL CO.

Eddy Co., N. Mex.—Apr. 22, '40—Begins with 28-28.9 at $0.61, plus 2c per degree gravity up to 40 & above at $0.85.

Mirando, Tex.—Jan. 1, '41—same as Humble, except Continental begins with 20-20.9 at $0.88.

Refugio, Tex.—Jan. 1, '41—same as Humble, except Continental begins with 20-20.9 at $0.93.

Clara Driscoll, Tex.—Jan. 1, '41—20-20.9 at $0.93; 1c differential per degree of gravity up to 40 & above at $1.13.

Alfred & Magnolia City, Tex. (Jim Wells Co.)—Jan. 1, '41—$1.08.

PAN AMERICAN PIPE LINE CO.

Hastings & So. Houston, Tex. crudes—Oct. 1, '40—same as Humble Texas Gulf Coast except Pan Am. begins with Below 21 at $0.88.

Cayuga, Anderson Co., Tex.—Oct. 2, '39—$0.78.

East Texas—Jan. 1, '41—$1.10.

CRUDE OIL PRICES *(Continued from preceding page)*

CALIFORNIA *Posted by Standard Oil of California*

All gravities above those quoted take highest price offered in the field. Prices effective Feb. 1, 1940

Gravity	Signal Hill (Long Beach) and others*	Seal Beach	Huntington Beach	Inglewood	Playa Del Rey	Olinda Brea Canon	Athens-Rosecrans	Torrance	Richfield	Whittier East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	Greeley Canal	Coles Levee Richfield Western	Mountain View and others**	Elk Hills, Buena Vista Hills, Midway-Sunset, Lakeview Area	Lost Hills	Coalinga	Wheeler Ridge	Santa Maria Val. (Union Oil, Sept. 1 '39)
14-14.9	$0.65	$0.64	$0.63	$0.64	$0.65	$0.61	....	$0.65	$0.61	$0.61	$0.62	$0.63	....	....	....	$0.60	$0.60	$0.60	$0.60	....	$0.42
15-15.9	.65	.64	.63	.64	.65	.61	....	.65	.61	.61	.62	.63	....	....	....	.60	.60	.60	.60	....	.44
16-16.9	.65	.64	.63	.64	.65	.61	....	.65	.61	.61	.62	.63	....	....	....	.60	.60	.60	.60	....	.45
17-17.9	.65	.64	.63	.68	.65	.61	....	.65	.61	.61	.62	.63	....	....	....	.60	.60	.60	.60	....	.46
18-18.9	.65	.64	.63	.71	.65	.65	....	.68	.61	.61	.62	.63	....	....	....	.60	.60	.60	.60	....	....
19-19.9	.69	.64	.67	.75	.70	.69	....	.72	.61	.65	.62	.63	....	....	....	.60	.64	.64	.61	$0.60	....
20-20.9	.73	.64	.72	.79	.76	.74	....	.75	.65	.69	.62	.67	....	....	....	.60	.69	.69	.62	.60	....
21-21.9	.78	.64	.76	.82	.81	.78	....	.79	.69	.73	.62	.72	$0.63	....	....	.64	.74	.74	.66	.60	....
22-22.9	.82	.69	.81	.86	.86	.82	....	.82	.73	.77	.66	.76	.63	....	....	.68	.79	.78	.70	.63	....
23-23.9	.86	.75	.85	.89	.92	.86	$0.71	.86	.78	.82	.71	.81	.67	....	....	.71	.84	.82	.74	.67	....
24-24.9	.90	.80	.90	.93	.97	.90	.77	.89	.82	.86	.75	.85	.72	....	....	.75	.89	.86	.78	.71	....
25-25.9	.95	.86	.94	.96	1.02	.95	.82	.93	.86	.90	.80	.89	.77	....	....	.79	.94	.90	.82	.75	....
26-26.9	.99	.91	.99	1.00	1.08	.99	.88	.96	.90	.94	.84	.94	.82	....	....	.83	.99	.95	....	....	....
27-27.9	1.03	.97	1.03	1.04	....	1.03	.94	1.00	.94	.98	.89	.98	.87	$0.83	$0.92	.87	1.04	.99	....	....	....
28-28.9	1.07	1.02	1.07	1.07	....	1.07	.99	1.03	.98	....	.93	1.02	.91	.86	.96	.91	1.09	1.03	....	....	....
29-29.9	1.10	1.07	1.11	1.10	....	1.10	1.04	1.06	1.02	....	.98	1.06	.96	.90	.99	.95	1.14	1.07	....	....	....
30-30.9	1.14	1.12	1.15	1.14	....	1.14	1.09	1.09	Elwood Terrace		1.02	1.10	1.01	.94	1.02	.99	1.19	1.11	....	....	....
31-31.9	....	....	....	1.17	....	1.17	1.14	F. O. B. ship.			1.07	1.14	1.05	.98	1.06	1.02	1.24	Kettleman Hills			
32-32.9	....	....	....	1.20	....	1.20	1.19	$1.21			1.11	1.18	1.09	1.02	1.09	1.06	1.29	....	$1.12	....	....
33-33.9	....	....	....	....	....	....	1.24	1.25			1.15	1.22	1.14	1.06	1.13	1.10	1.34	....	1.17	....	....
34-34.9	....	....	....	....	....	....	1.29	1.29			1.20	1.26	1.19	1.10	1.16	1.14	....	....	1.21	....	....
35-35.9	....	....	....	....	....	....	1.34	1.33			1.24	....	1.23	1.14	1.20	....	....	....	1.25	....	....
36-36.9	....	....	....	....	....	....	1.39	1.37			1.28	....	1.27	1.18	1.23	....	....	....	1.29	....	....
37-37.9	....	....	....	....	....	....	1.44	....			1.33	....	1.31	1.22	1.26	....	....	....	1.33	....	....
38-38.9	....	....	....	....	....	....	1.49	....			1.37	....	1.36	1.25	1.30	....	....	....	1.38	....	....
39-39.9	....	....	....	....	....	....	1.54	....			1.42	....	....	1.29	1.34	....	....	....	....	....	....
40-40.9	....	....	....	....	....	....	1.59	....			1.46	....	....	1.33	1.37	....	....	....	....	....	....
41-41.9	....	....	....	....	....	....	....	....			1.50	....	....	1.37	1.40	....	....	....	....	....	....
42-42.9	....	....	....	....	....	....	....	....			1.54	....	....	1.41	1.44	....	....	....	....	....	....
43-43.9	....	....	....	....	....	....	....	....			1.59	....	....	1.45	1.47	....	....	....	....	....	....
44-44.9	....	....	....	....	....	....	....	....			1.63	....	....	1.49	1.51	....	....	....	....	....	....
45-45.9	....	....	....	....	....	....	....	....			1.67	....	....	1.53	1.54	....	....	....	....	....	....
46-46.9	....	....	....	....	....	....	....	....			1.71	....	....	1.57	1.57	....	....	....	....	....	....
47-47.9	....	....	....	....	....	....	....	....			....	....	....	1.61	....	....	....	....	....	....	....
48-48.9	....	....	....	....	....	....	....	....			....	....	....	1.64	....	....	....	....	....	....	....

FOB Standard Pipeline

*El Segundo prices same as Signal Hill. Wilmington prices same as Signal Hill, except below 19 gravity prices are: 14-16.9, $0.60; 17-17.9, $0.62; 18-18.9, $0.64.
**Includes Newhall, McKittrick, Kern River, Round Mountain and Kern Front, schedule for which ends with 19-19.9. Mountain View schedule begins with 19-19.9.

LOUISIANA-ARKANSAS

Posted by S. O. Louisiana, Oct. 17, '40

Gravity	Bunkie, La. etc.	Caddo, La. etc.	Darrow, La. etc.	University, La. (Baton Rouge)	Atlanta, Ark. etc.
Below 21	....	....	$0.75	$0.91	$0.55
21-21.9	....	....	.77	.93	.57
22-22.9	....	....	.79	.95	.59
23-23.9	....	....	.81	.97	.61
24-24.9	....	....	.83	.99	.63
Below 25	$0.83	$0.73	....	....	....
25-25.9	.85	.75	.85	1.01	.65
26-26.9	.87	.77	.87	1.03	.67
27-27.9	.89	.79	.89	1.05	.69
28-28.9	.91	.81	.91	1.07	.71
29-29.9	.93	.83	.93	1.09	.73
30-30.9	.95	.85	.95	1.11	.75
31-31.9	.97	.87	.97	1.13	.77
32-32.9	.99	.89	.99	1.15	.79
33-33.9	1.01	.91	1.01	1.17	.81
34-34.9	1.03	.93	1.03	1.19	.83
35-35.9	1.04	.94	1.04	1.20	.84
36-36.9	1.05	.95	1.05	1.21	.85
37-37.9	1.06	.96	1.06	1.22	.86
38-38.9	1.07	.97	1.07	1.23	.87
39-39.9	1.08	.98	1.08	1.24	.88
40 & above	1.09	.99	1.09	1.25	.89

Bunkie, La. schedule includes Eola and Olla, La.

Caddo, La. schedule includes De Soto, Homer, Sabine & Sugar Creek, La., Fouke & Miller County, Ark.

Darrow, La. schedule includes, Bayou des Glaise, Bayou, Mallet, Choctaw, Jeanerette, Lirette, No. Crowley, Port Barre, Potash, Roanoke & St. Martinville, La.

Atlanta, Ark. schedule includes Buckner, Magnolia, Village & Schuler (Jones Sand Oil), Ark.

Cotton Valley:		Rodessa	$1.05
Crude	$1.05	Shreveport (Cross Lake)	1.05
Distillate	1.10	Smackover (Heavy)	.73
Holloway Sand Crude	1.10	Dorcheat, Big Creek, & McKamie (Sour Distillates)	.95

(Continued in next column)

LOUISIANA-ARKANSAS (Cont'd)

Posted by Shell Oil Co., Inc. (Aug. 29, '39)
Iowa District, La.

Below 18	$0.75	23-23.9	$0.89	29-29.9	$1.04	
18-18.9	.77	24-24.9	.92	30-30.9	1.06	
19-19.9	.79	25-25.9	.95	31-31.9	1.08	
20-20.9	.81	26-26.9	.98	32-32.9	1.10	
21-21.9	.83	27-27.9	1.00	33-33.9	1.12	
22-22.9	.86	28-28.9	1.02	34 & above	1.14	

Black Bayou & White Castle Districts, La.—same as Iowa District, except Black Bayou, etc. begins with Below 20 at $0.79.

Gibson Field, Terrebonne Parish, La. $1.04
Happytown Field, St. Martin Parish, La.

(Jan. 12, '40) 1.00

Posted by Arkansas Fuel Oil Corp.

Urania, La. (Jan. 3, '41) $0.95

Posted by Continental Oil Co.

Tepetate & Ville Platte, La. (Oct. 11, '38) ... $1.03

Abbeville, La. (Jan. 1, '39)

35-35.9	$.92	37-37.9	$0.96	39-39.9	$1.00
36-36.9	.94	38-38.9	.98	40 & above	1.02

CANADIAN FIELDS

Posted by Imperial Oil Limited
Western Ontario (Nov. 6, 1939)

Petrolia ..... $2.10 Oil Springs $2.17

Turner Valley Crude Oil (Sept. 12, '40)
(Prices FOB producer's tankage)

33-33.9	$1.08	44-44.9	$1.30	55-55.9	$1.52
34-34.9	1.10	45-45.9	1.32	56-56.9	1.54
35-35.9	1.12	46-46.9	1.34	57-57.9	1.56
36-36.9	1.14	47-47.9	1.36	58-58.9	1.58
37-37.9	1.16	48-48.9	1.38	59-59.9	1.60
38-38.9	1.18	49-49.9	1.40	60-60.9	1.62
39-39.9	1.20	50-50.9	1.42	61-61.9	1.64
40-40.9	1.22	51-51.9	1.44	62-62.9	1.66
41-41.9	1.24	52-52.9	1.46	63-63.9	1.68
42-42.9	1.26	53-53.9	1.48	64 & over	1.70
43-43.9	1.28	54-54.9	1.50		

Absorption Gasoline (Jan. 5, 1938)

90% Rec., 20 lb. Reid v.p. $1.94
90% Rec. 17 lb. Reid v.p. $2.08

ROCKY MOUNTAIN FIELDS

Posted by Stanolind Oil & Gas Co. (Oct. 11, '38)

Salt Creek (except Tensleep grade), Midway & Dutton Creek, Wyo.

Below 29	$0.86	32-32.9	$0.94	36-36.9	$1.02
29-29.9	.88	33-33.9	.96	37-37.9	1.04
30-30.9	.90	34-34.9	.98	38-38.9	1.06
31-31.9	.92	35-35.9	1.00	39-39.9	1.08
				40 & above	1.10

Wyoming:		Wyoming:	
Tensleep Crude	$0.646	Grass Creek Light	$0.90
Frannie Light	.55	Grass Creek Heavy	.40
Frannie Heavy	.42	Elk Basin Light	.90
Hamilton Dome	.35	Hes, Colo. Heavy	.92

Posted by S. O. Indiana (June 5, '39)

Lance Creek, Wyo. $0.77

Posted by Ohio Oil Co. (Oct. 11, '38)

Elk Basin, Wyo. $0.90
Grass Creek, Wyo. Light ..... .90
Rock Creek, Wyo. 1.00
Lance Creek, Wyo. ..... .77
Dry Creek, Mont. ..... .92
Sunburst, Mont. (Nov. 16, '37) ..... .90

Posted by Continental Oil Co. (Oct. 11, '38)
Ft. Collins & Wellington, Col.

28-28.9	$0.81	32-32.9	$0.89	36-36.9	$0.97
29-29.9	.83	33-33.9	.91	37-37.9	.99
30-30.9	.85	34-34.9	.93	38-38.9	1.01
31-31.9	.87	35-35.9	.95	39-39.9	1.03
				40 & above	1.05

Canon City & Florence, Col	$0.90	Big Muddy, Wyo.	$0.98
Cat Creek, Mont.	1.10	Lance Creek, Wyo.	0.77

CLASSIFIED

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2 Horizontal Storage Tanks Approximately 11480 gals. 1 Horizontal Storage Tank Approximately 6300 gals. 1 Horizontal Storage Tank Approximately 2000 gals. 1 Three Compartment 455 gal. Truck Tank. Box No. 855.

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ADVERTISERS' INDEX

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· PERSONALS ·

Appointment of **Dr. R. T. Goodwin** (NPN, Nov. 27, 1940, p.48) as manager of the aviation department of Shell Oil Co. Inc., has moved into top positions three Shell men who through successive promotions have worked their way from the ranks.

Jack Lewis Minner succeeds Dr. Goodwin as manager of the fuel oil sales department, and will be assisted by **Carlyle J. Stockbridge** and **Colman M. Mockler.** These three will have complete charge East of the Rockies of sales of tractor, diesel, domestic, industrial and bunker fuels, kerosine, and petroleum coke.

Mr. Minner started with Shell in 1925 after graduating from Washington University in St. Louis, Mo., where he was an outstanding athlete and a member of Beta Theta Pi fraternity. Since joining Shell, he has been manager of the shipping and supplies department, assistant manager of tank car sales, and fuel oil sales manager in the Middle West. Last September, he was transferred to New York when Shell's Eastern and Mid-Western marketing units combined.

Mr. Stockbridge came with Shell in 1929 after many years with United Fruit Co., several of which were spent in Central America. He was promoted to assistant district manager of Shell's New York division in 1930, and then made assistant bulk sales manager. In 1937, he became assistant manager of the fuel oil sales department in the New York office.

Mr. Mockler joined Shell in St. Louis eleven years ago as assistant general credit manager. He graduated from St. Louis University, secured his LL.B. degree from Benton College of Law, and was admitted to the Missouri Bar. Mr. Mockler brought to Shell several years of banking experience, as he was previously associated with the Mercantile Commerce Bank and Trust Co., St. Louis. In 1934, he was made Shell's wholesale credit manager and assistant manager of the fuel oil sales department in 1937. He was also transferred to New York last September.

The new heads of Shell's fuel oil sales are all family men: Mr. Minner has two children, Mr. Mockler has three, and Mr. Stockbridge has one.

* * *

A cold with a stinger in its tail caught up with **Ray Ludlow** last week. But the application of "sure-cure" sent him by NPN at Murray Hill Hospital, 30 E. 40 St., N.Y.C., should have him back at his desk in no time. The "sure-cure" was a NPN story telling of 100% endorsement of the "1000-mile Lubrication Campaign" by the Chief of Minnesota's Highway department. (See NPN, Jan. 29, p. 11). Mr. Ludlow is secretary of A.P.I.'s Lubrication Committee

* * *

Chauncey Howard, Tulsa, in charge of Shell Oil Co.'s budget records, has been elected president of the Tulsa County League of Young Democrats.

* * *

In appreciation for his contributions in the field of archaeology, the membership of the Oklahoma State Archaeological Society has conferred upon **Robert S. Ellison,** formerly of Tulsa and now of Manitou, Col., an honorary life trusteeship in the society. The retired president of Stanolind Pipe Line Co. and Stanolind Crude Oil Purchasing Co. was active in organization of the archaeological society and was member of the Board of Trustees before moving to Colorado.

The society also elected to the Board of Trustees the following oilmen: **T. J. Darby,** independent oilman; **James H. Gardner,** president of Gardner Petroleum Co.; **Charles W. Grimes,** oil producer and **Glenn R. V. Griffith,** engineer with U. S. Geological Survey. All are Tulsans. Other officers elected included **W. W. Warner** of Nowata, Okla., producer, first vice-president and **George W. Lisle,** Tulsa, Mid-Continent Petroleum Corp., secretary. **John Steiger,** of NPN's Tulsa bureau, is editor of the society's publication, *The Oklahoma Prehistorian.*

* * *

E. F. Borgolte, who has operated as Security Petroleum Co. in Kansas City for many years, will be resident manager of Akin Gasoline Co.'s new branch office in the Wesley Temple building, Minneapolis. Akin's main office is in Tulsa.

* * *

James W. Rees, Chicago, Pure Oil Co., formerly office and employment manager of the company, has now assumed duties of assistant general purchasing agent of Pure Oil. Mr. Rees has been with Pure since 1925. He is vice-president of the Office Management Assn. of Chicago, and a member of the Chicago Assn. of Commerce.

* * *

Six-foot-three **Joe Bisaillon,** St. Paul, Minn., has joined the L. Sonneborn Sons, Inc., as representative for Minnesota, Iowa and Wisconsin. Mr. Bisaillon has had 16 years experience in merchandising Pennsylvania oil and lubricants. He was married three years ago.

* * *

W. W. Bruce, Ponca City, executive vice-president of Continental Oil Co., announces appointment of **Theodore M. Cady** as superintendent, land department, of Texon Oil & Land Co., with headquarters at Wichita. Mr. Cady was engaged in proration work for the State of Kansas from 1935 to 1937, when he joined Conoco.

* * *

At the annual managers meeting, Jan. 29 at Chicago, of Mid-Continent Petroleum Corp.'s subsidiary marketing units, **C. L. Dorris,** Tulsa, manager of subsidiary marketing, presided. Others present were: **Ralph E. King,** Racine, Wis., general manager Diamond Oil Co.; **Frank Brocksus,** Kalamazoo, Mich., Kalamazoo Diamond Oil Co.; **Elzie Huot,** Kankakee, Ill., president, Baron-Huot Oil Co.; **Carl Nelson,** St. Paul, manager Atlas Gas and Oil Co.; and **E. B. Saxe,** Flint, Mich., general manager Genessee Diamond Oil Co.

Jack L. Minner

Carlyle J. Stockbridge

Colman M. Mockler

Refining Technology

INCLUDING INTERNATIONAL PETROLEUM TECHNOLOGY

100-OCTANE FUEL The oil industry's ability to produce nearly 1,500,000 gallons daily of 100-octane aviation fuel by March 1, 1941, as reported recently by the American Petroleum Institute committee on defense policies, and potential ability to double this rate of production by March 1, 1942, raises the question whether this potential volume of aviation fuel will be needed by that time.

The answer to that question can be derived partially from facts presented by T. P. Wright, vice president for engineering, Curtiss-Wright Corp., and consultant for the National Defense Advisory Commission, in an extended discussion of "The Truth about Our National Defense Program" in January AVIATION. The famous "50,000 Planes-A-Year Program" of last May has not been converted from talk to contracts. At the time of writing it has only reached a point where "contracts, including commitments to the British, point to an Army Air Force of about 18,000 planes and for the Navy of about 7000," said Mr. Wright. "Instead of completing the construction of approximately 40,000 planes (15,000 for the British) by the Spring of 1942, the date will be in the Summer of that year and instead of attaining an industrial capacity by that time of 40,000 planes a year, it will be about 30,000. Thus the 50,000 plane air force and the 50,000 plane-per-year industrial capacity is far ahead of us and present programs must be greatly augmented to achieve these objectives." The present rate of airplane deliveries, he estimated at close to 1000 per month for Feb. 1, 1941, which is four times deliveries a year ago.

Comparable with the quadrupling of airplane deliveries to the U. S. Army and Navy and to the British, is the similar quadrupling of the aircraft industry's backlog of unfilled orders, reported as "slightly above $3,500,000,000." The "slight" additional $116,000,000 worth of estimated orders is "slightly" under four times what it takes in plant construction to double the production of 100-octane aviation fuel a year from now, according to the A.P.I. committee report. Such figures make the petroleum industry's part in the defense program seem insignificant but nevertheless 100-octane fuel production is the keystone in the present air defense program and the industry can take credit for being prepared for it.

Productive plants in the aircraft industry nearly doubled their space during 1940 and will redouble it by June, 1941, it is anticipated. Cost of plants already completed is $83,400,000 and $232,200,000 will be spent to complete the expansion program. Employment in these plants was 60,000 a year ago; will be 382,000 by June, 1941.

The third factor in the aircraft defense program is pilots to fly the airplanes. More than 15,000 preliminary and 3000 secondary students now in training will finish in February. At that time 15,000 more preliminary and 5000 more secondary students will start courses, to be completed in June. More than 55% of the students completing the secondary course already have been accepted by the Army or Navy, while more than 2000 students of preliminary courses have been taken by the Service without taking secondary.

★ ★ ★

FIFTH ANNIVERSARY Five years ago today, Feb. 5, 1936, NATIONAL PETROLEUM NEWS gave special recognition to consumers of petroleum by publishing a 512-page issue describing many phases of the oil industry for the benefit of those outside the industry. This issue had so much of interest and value in it that it became a textbook for thousands in the industry and it is still a valuable reference.

Looking back over the refining advances in the five years since this issue was published it becomes more readily obvious why the refiner has to amortise his investment in plant in five years. If this were strictly true all of the equipment in use today that was in operation when this big issue was published would be obsolete. It is difficult to believe that this is true yet when the changes are counted, such as commercialization of polymerization, catalytic cracking, alkylation, isomerization, hydrogenation, and recycling process, as well as improvements in thermal cracking and desulfurization and other treating methods which were not in use five years ago, it becomes a little easier to conceive of the rapidity of progress. To this could be added the improvements in motor fuel and lubricant quality of the past five years during which efforts have been concentrated on octane number of motor fuel and on the use of chemical additives for improving several motor fuel properties.

During the past five years the actual average gain in gasoline derived from a barrel of crude was only 2/3 of a gallon, i.e. 45% of the products from a barrel of crude was gasoline in 1939 as compared with 43.4% in 1934. However, many refiners are getting over 60% and yields up to 80% or over are said to have been made possible. Gains for preceding 5-year periods, going progressively backward in time, are 4%, 7.3%, 6.9%, and 7.0%. The yield in 1914 averaged only 18.2% gasoline. It is probably significant that the yield of gas oil and residual fuel oil increased slightly during the last five-year period for the first time since 1914-1919 although this increase can all be accounted for by a decrease in kerosine yield from 6.0% to 5.5%. These changes are all in spite of motor fuel demand jumping from 407,106,000 barrels in 1934 to 555,509,000 barrels in 1939 for a 36.5% gain.

We have already been promised 100-octane motor fuel five years ahead by a few who claim ability to see that far ahead. If this period is as full of advances as the past five years there will be no opportunity for interest to flag.

Close Fractionation Obtained With

ABSTRACT

Fractionating columns packed with Stedman shaped-wire-cloth type packings are believed to offer a better combination of operating characteristics for close fractionation in all except a few special applications. Performance of several different types of tower packing are compared, making use of published data, which so far is confined to the performance of columns of laboratory size. In recent tests mixtures of benzene and ethylene dichloride were employed at total reflux and atmospheric pressure in columns up to 12 inches in diameter.

Stedman packings have been developed in plain conical cell and triangular pyramid grid types, usually employing 40 x 60 mesh cloth with 0.009-inch diameter stainless steel wire. The first type is made in three diameters, 25 mm. maximum, and the latter in three diameters (2, 3, and 6 in.) and one triangular shape with 6-inch sides.

This packing material seems to be the only one offering a large number of theoretical plates per foot of height in the larger diameters.

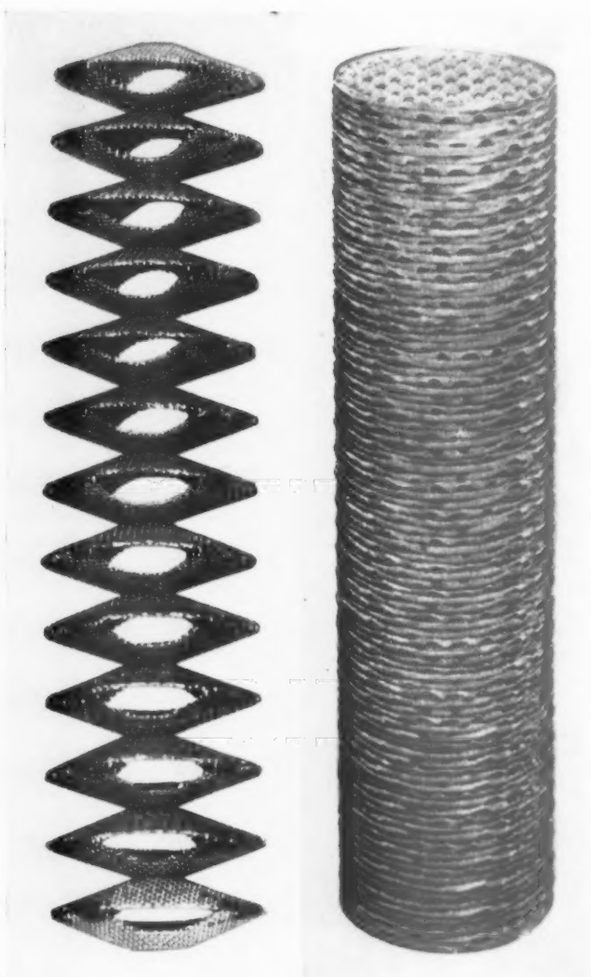

Fig. 1. The construction of the conical type packing (left) and triangular pyramid type packing (right). Circular sheets with upturned rim are punched for passage of vapors

IN A paper presented at the Toronto meeting of the American Institute of Chemical Engineers in 1936, D. F. Stedman[14] discussed a new type of tower packing material. The principles of the operation of this packing were explained and preliminary test data were submitted which indicated the promising characteristics of several sizes and patterns of the packing.

The development of this packing material was carried further by Stedman in the laboratories of the National Research Council of Canada at Ottawa[15] and the packing was patented in the United States[16], Canada[17] and elsewhere. It is being further developed by Foster Wheeler Corp. and a number of different sizes and types have been produced and studied, test data on the operating characteristics of six different sizes having been published[4,5].

In the smaller sizes, which at present include 0.375 inch, 0.750 inch and 25 millimeter (0.984 inch) nominal diameters, called Nos. 105, 104 and 112, respectively, the packing is constructed in the single cell conical type. This type is made of wire cloth which has been embossed and trimmed into flat, truncated, conical discs. A semi-circular hole is cut out of one side of the cone and extends about two-thirds of the distance from the edge of the cone to the flat in the center. The discs are welded together alternately back to back and edge to edge, forming a regular series of cells. The holes, which serve as vapor passageways, are located alternately on opposite sides of the section of packing. The construction may be more readily understood by reference to Fig. 1.

In operation, reflux liquid flows along the wire cloth and seals the openings of the mesh. The liquid flows out toward the walls of the column on a cone that is concave downward, and then back toward the center of the column on a cone that is concave upward, which is welded to the first cone at the outer edge. The lower cone is welded to another still lower cone at the center and the liquid flows through the mesh at the point of junction, then outward toward the walls on this lower cone, and so on until the liquid drops off the lowest cone of the column. The vapor enters the space between two cones, which are welded around the outer edges, through the vapor hole in the lowest cone. The vapor then flows through the space between these two cones, practically at right angles to the axis of the column, and out through the vapor opening in the upper cone of the pair. The vapor then divides and flows around the point where two cones are joined back to back, and across to the side of the column where it first entered the packing. This flow is repeated until the vapor leaves the packing at the top of the column.

With the single cell conical type of packing the number of sheets of wire cloth per unit of height of packing decreases with increasing diameter. As a result the contacting efficiency per unit of height of packing decreases rapidly with increasing diameter. This could be offset

Stedman Packed Towers†

By L. B. Bragg*

to some extent by flattening the cones as the diameter increased, but such a change would result in reducing the capacity of the packing and could be made to a limited extent only without destroying the liquid distribution. It is expected at a 37-mm. (1.457 inch) nominal diameter conical-type packing will be produced, but as will be seen from the data presented hereafter, commencing with about 2-inch diameter, a multiple cell triangular pyramid type of packing is preferable.

Triangular Pyramid Type

The triangular pyramid type is also made of wire cloth which has been punched, blanked and embossed to form circular sheets having a regular pattern of raised triangular pyramids and an upturned lip around the circumference. The pyramids are located on three-eighth-inch equilateral triangular centers. The sheets are also perforated with three-sixteenth-inch diameter holes located on three-eighth-inch equilateral triangular centers between the pyramids.

The pattern on the circular sheets is placed so that by rotating adjacent sheets 120 degrees with respect to each other, the so-called "valleys" at the junctions of the bases of the pyramids of the upper sheet come immediately above the apexes of the pyramids of the lower sheet. The sheets are welded togther at these points of contact. This placing of adjacent sheets causes the holes of the lower sheet, which serve as vapor passageways, to be located below the apexes of the pyramids of the upper sheet. The construction may be more readily understood by reference to Fig. 2. The three sizes of packing on which tests are reported herein had diameters of 2.080 inches, 3.080 inches and 6.080 inches called Nos. 128, 107 and 115, respectively.

In operation the liquid flows along the wire cloth and seals the openings of the mesh. The liquid flows down the sides of the triangular pyramids, dividing into three portions as it does so. Then it flows along the mesh at the base of the pyramids until it reaches the center of the so-called "valley" at the junction of the edges of three pyramids. Here it flows through the cloth to the peak of the pyramid of the next lower sheet of cloth which is welded to the upper sheet at this point. The liquid flows continuously in this manner from the top to the bottom of a section of packing, repeatedly dividing into three streams and then combining three streams so as to give a very effective distribution and mixing of the liquid. The tendency of this action to flow liquid toward the walls of the column is counter-balanced by the tendency of the upturned lip to flow liquid from the walls toward the center. The vapor flows upward through the vapor openings into the space below a pyramid. Here the vapor stream divides into three parts and then each part flows

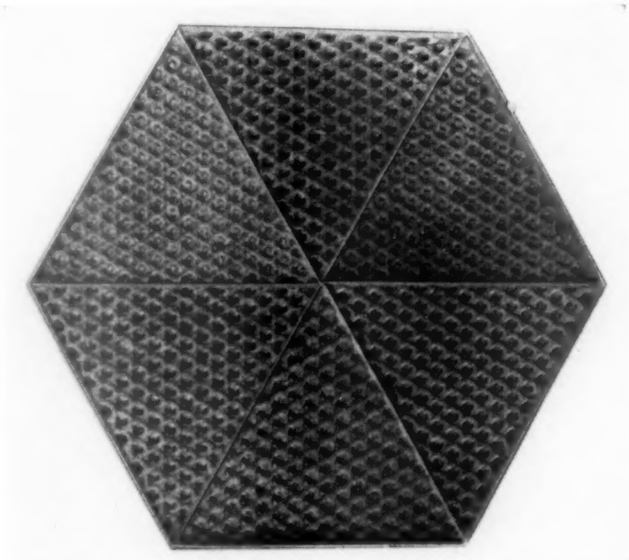

Fig. 2. Triangular pyramid type packing is also made in triangular sheets fitted together for a column of hexagonal cross-section

†Presented before the American Institute of Chemical Engineers meeting in New Orleans Dec. 2-4, 1940, and published in Vol. 37, No. 1, 1941 Institute Transactions.

*Foster Wheeler Corp., Carteret, N. J.

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upward through vapor openings in the next higher sheet of cloth together with vapor that in each case came from two other vapor openings. This flow is repeated until the vapor leaves the packing at the top of the column, giving good distribution and mixing of the vapors the same as is the case with the liquid.

Packing for Large Columns

As the diameter of the column increases it becomes desirable to modify the packing so that standard sections of packing may be used for various column diameters. This desideratum has been satisfied by manufacturing packing having an equilateral triangular cross-section, 6.000 inches long on a side of the triangle. These sections may then be fitted together to pack a column of hexagonal cross-section of any capacity.

There is a continual mixing and separation of both liquid and vapor so that channeling is not possible. The column in which the packing is inserted must fit the packing closely, so that any openings between the packing and the column are sealed by the liquid to prevent by-passing of the vapor. The underside of the liquid stream is exposed to the vapor as it flows along the mesh of the screen and the irregularities of the woven screen cause turbulence in the liquid stream, so that the liquid is well exposed to the vapors and the equivalent of an equilibrium contact is quickly attained.

The packing is customarily fabricated from stainless-steel wire cloth 40 x 60 meshes per inch, using wire 0.009 inch in diameter. It may, however, be made of any other material that can be drawn into wires and woven into cloth of the proper mesh, in accordance with the particular use to which the packing is to be put. Other mesh sizes will be satisfactory, so long as the packing has sufficient mechanical strength and the surface tension of the liquid is great enough to seal the openings of the mesh, but certain sizes of mesh and wire diameter are best[15].

Testing of Packing

The several different types of packings were tested—the conical-type in Pyrex glass columns equipped with silvered vacuum jackets[3-4], the round triangular pyramid-type in steel columns equipped with vapor jackets[5], and the hexagonal column in a steel column having a cylindrical outer shell and a hexagonal inner shell. The space between the inner and the outer shells was closed at the top but open to the vapors at the bottom, thereby providing a vapor jacket. The packed columns were connected to a still with a reflux rate measuring device, a column head and a condenser with provision being made for measuring the holdup and friction loss of the column and for obtaining samples of the reflux entering the top of the column and of the reflux leaving the base of the column[3-4-5]. A binary mixture of benzene and ethylene dichloride was used in all tests. All tests were made at atmospheric pressure and with total reflux.

The flood points were determined by increasing the distillation rates by substantially equal steps and noting the point at which the bottom reflux rates decreased suddenly. The points of complete flooding were obtained by increasing the distillation rate until a completely flooded condition was observed in the case of the conical type; or until the friction loss through the columns, fluctuations in the friction loss readings, and a constantly decreasing level of the liquid in the still indicated that the column was completely flooded in the case of the triangular pyramid-type packing. With the triangular pyramid type of packing in the steel columns, since the level of liquid in the column could not be observed, it was possible to have a condition where the reflux head of the column was partially flooded, which condition apparently existed at the point of so-called complete flooding with the No. 128 packing and possibly with others.

Packing Must Be Wet

With all types of packing it was found necessary to wet the packing thoroughly before the full efficiency could be developed. The packing was wet by running the column at a rate above its capacity until it became completely flooded. The rate of distillation was next reduced until the flood subsided, and was then set at the point desired for the test being run.

In order to reach an equilibrium condition it was found necessary to continue the distillation for fairly long periods of time. A procedure was adopted whereby at the lower rates of distillation the columns were operated for eight hours before taking the reflux samples. At the higher rates of distillation the columns were operated for 5 hours before taking the samples, following which it was possible to change the reflux rate to an operating condition which was expected to give a lower efficiency, and then take a second set of samples 3 hours later. Occasional checks showed that this method of procedure made it unnecessary to regularly obtain check samples.

The reflux samples removed from above and below the packing were analyzed by refractive index, and the number of theoretical plates was calculated by means of the equation of Beatty and Calingaert[2], using values of relative volatility reported by Smith and Matheson[13]. The values of relative volatility are nearly constant over the atmospheric pressure boiling range of mixtures of benzene and ethylene dichloride, but the slight error attendant upon the use of an average value of relative volatility was avoided by using a plot of theoretical plates vs. refractive index[3-4].

Column Operation Factors

It has been rather common in the past to submit as data on the operation of packed columns, theoretical plates per foot of packed column and the inverse factor H. E. T. P. (*height equivalent to a theoretical plate in inches*), the holdup of the column in question expressed in some convenient unit of volume measurement, and the friction loss through the column. These several types of data were frequently obtained at various boilup rates, and have been presented by some authors in graphical form comparing the above-mentioned characteristics at various boilup rates.

However, except for the H. E. T. P. factor, the data obtained have generally not been presented on a basis that would permit ready comparison of various types and sizes of packing material. It has been the author's particular purpose in this paper to work out a series of factors showing data in such form that it will be readily comparable, one diameter with another and one type of packing with another. The factors used are as follows:

1. As a factor to express the fractionating ability of the column, the author has used the familiar factor "H. E. T. P."

2. As a *capacity factor*, S, the boilup rate expressed as gallons of liquid boiled up per hour was divided by the cross-sectional area of the column expressed in square inches.

3. A *holdup factor*, W, which would express the holdup of the column in terms of the fractionating ability of the column and the throughput of the column, was obtained by dividing the holdup of the column expressed in gallons by the number of theoretical plates in the column and by the boilup rate of the column expressed in gallons per hour and multiplying by 1000. *Liquid and vapor holdup* of a column in gallons per foot is designated as H.

4. A *friction loss factor*, D, was obtained which would express the friction loss in terms of the fractionating ability by dividing the friction loss of the column expressed as inches of water by the number of theoretical plates in the column. *Friction loss through column* in inches of water per foot is designated as F.

5. A *column work factor*, C, which would express both fractionating ability and throughput, was obtained by dividing the number of theoretical plates in the column by the length of the column, and multiplying this quantity by the capacity factor S.

6. A *wire cloth factor*, B, which is of particular interest with the Stedman packing, indicating the fractionating ability of an individual sheet of wire cloth, was determined by dividing the number of theoretical plates in a column by the number of sheets of wire cloth in the same column.

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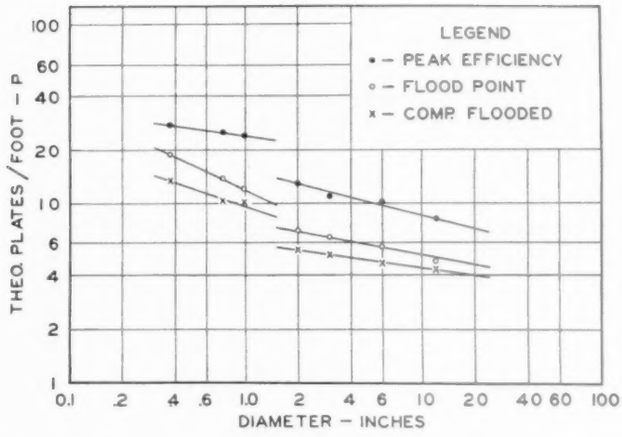

Fig. 7. The straight-line plots of theoretical plates per foot (P) vs. column diameters on log-log paper indicates expected values of P in large diameter columns

7. A *wire cloth work factor*, E, which indicated both the fractionating ability of a sheet of wire cloth and the throughput of the column, was obtained by multiplying the factor B by the factor S.

Test Results

Test results obtained with the 7 sizes of Stedman packing, as well as with empty columns, are shown in Table I and are also presented graphically in Figures 3 to 7. In Table I and also in Table II the actual length of packing used, expressed in feet, is indicated by the number in the subheading under the headings for the friction loss, the holdup and the number of theoretical plates. In the case of the empty columns, the figure used indicates the approximate length of the column.

In Fig. 3 the values of H. E. T. P. and W are plotted against the diameters of the columns using data at the points of efficiency, at the initial flood points of the columns and at the points of complete flooding of the columns. No values of H. E. T. P. were obtained at the points of complete flooding with the 3.080-inch diameter and 6.080-inch diameter columns and the value for the 12-inch hexagonal column seemed out of line with other data. Consequently, values of H. E. T. P. at complete flooding were assumed that would give a smooth curve substantially parallel to the curve for the initial flood point. The other operation factors were calculated from the corresponding values of P (*Theoretical plates per foot in column*). The data thus assumed or based on assumed data are enclosed in parentheses.

In Fig. 4 values of S and C are shown plotted against the diameter of the columns. In Fig. 5 values of B and E are shown plotted against the diameter of the columns showing a quite constant relationship.

In Fig. 6 values of D are plotted on a logarithmic scale against the diameter of the columns. This plot shows quite well the wide range of pressure drops per theoretical plate depending on the loading of the column. If a very low pressure drop is desired, this may be had by operation at low throughput whereas if pressure drop is not a factor, operation at high rates of throughput is possible.

Fig. 7 shows values of P plotted on a logarithmic scale against the diameter of the columns also on a logarithmic scale. Plotted in this manner the data appears to be well represented by straight lines which appear to indicate the values of P that may be expected in large diameter columns.

Other Types of Packing

Data available in the literature on several other types of packing have been recalculated to obtain values of the operation factors for comparison with Stedman packing. Calculations were made also for small empty glass columns of Rose[11], the concentric glass tube column of Selker, Burk and Lankelma[12] and on the Bruun[6] glass bubble-cap column.

These data are shown in Table II. All of the test data given in Table II were obtained using mixtures other than benzene and ethylene dichloride except those of Hall and Bachman[9]. Without exception all the other mixtures used will permit larger boilup rates expressed as volume of liquid handled than will benzene and ethylene dichloride and will also give lower friction losses at comparable operating conditions such as at the flood point. Consequently, in order that a proper comparison might be made, all of the operation factors were calculated for equivalent distillation of mixtures of benzene and ethylene dichloride.

In these calculations estimates had to be made of the composition of the liquid at the point in the column at which the reflux rate was measured. From these estimates and figures with regard to comparable maximum vapor velocities and vapor and liquid densities, correction factors were calculated which were used to determine operation factors that would be consistent with those obtained with mixtures of benzene and ethylene dichloride, as indicated in Table I.

The assumption was made that the holdup varied proportionately to the liquid throughput as a result of which there was no correction of the factor W for various liquids. Actually, the holdup generally decreases less rapidly than the liquid throughput, and this assumption favors data using mixtures of hydrocarbons which allow larger values of R (*liquid reflux rate in gallons per hour*) than benezene-ethylene dichloride mixtures.

The data of Rose[11] were obtained with mixtures of benzene and carbon tetrachloride and the values of R were reduced 8% in calculating S and C. Selker, Burk and

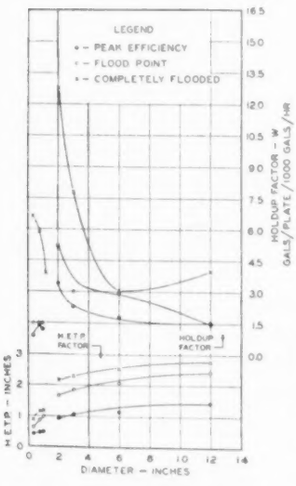

Fig. 3. Height equivalents to a theoretical plate for various column diameters

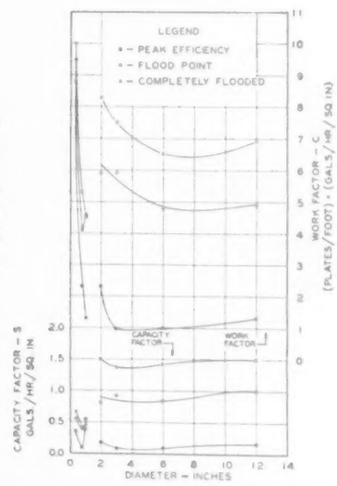

Fig. 4. Capacity (S) and work factors (C) for various column diameters

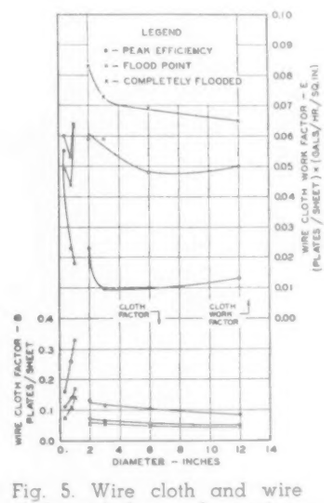

Fig. 5. Wire cloth and wire cloth work factors for various column diameters

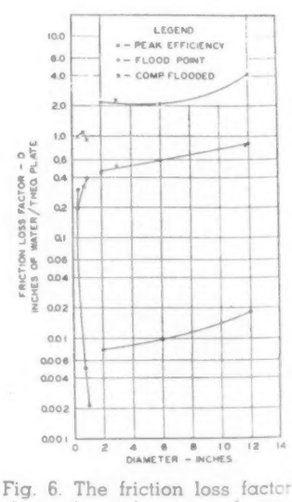

Fig. 6. The friction loss factor shows the wide range of pressure drops per theoretical plate depending on column loading

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Lankelma[12] used two mixtures. In the results obtained with n-heptane and methylcyclohexane the values of R were reduced 19% in calculating S and C, while the values of F were increased 48% in calculating D. In the results obtained with iso-octane and methylcyclohexane the values of R were reduced 21% while calculating S and C, while the values of F were increased 48% in calculating D. Bruun[6] also used two mixtures. Values of R were reduced 9% in calculating S and C from the test data in which mixtures of carbon tetrachloride and benzene were used, while they were reduced 21% in the calculations involving data in which mixtures of n-heptane and toluene were used.

Tongberg, Quiggle and Fenske[19] used four mixtures, n-heptane and toluene, n-heptane and methylcyclohexane, carbon tetrachloride and benzene, and methylcyclohexane and toluene. Only data from the first two mixtures were considered in this paper, the other data giving lower plate efficiencies. With the first mixture R was reduced 16% in calculating S and C. With the second mixture R was reduced 23% in calculating S and C, while F was increased 49% in calculating D.

Fenske, Tongberg, Quiggle and Cryder[5] used mixtures of n-heptane and methylcyclohexane and values of R were reduced 24% in calculating S and C, while values of F were increased 49% in calculating D. Tongberg, Lawroski and Fenske[18] used the same mixture and values of R were reduced 23% in calculating S and C. Fenske, Lawroski and Tongberg[7] used the same mixture, the values of R being reduced 23% while calculating S and C, the values of F being increased 49% in calculating D. In this case only data obtained after flooding the column were used. Baker, Barkenbus and Roswell[1] also used mixtures of n-heptane and methylcyclohexane and values of R were reduced 28% in calculating S and C, while for the same mixture used by Lecky and Ewell[10] values of R were reduced 25% in calculating S and C with F being increased 49% in calculating D.

It is interesting to note that, while a few of the several types of columns give lower pressure drops per theoretical plate and two combine low pressure drop and low liquid holdup per theoretical plate per unit of throughput, all columns have higher values of H. E. T. P. than Stedman packed columns of equivalent diameter. One column shows a lower value of H. E. T. P. but has a higher pressure drop per theoretical plate and higher holdup per theoretical plate per unit of throughput. In most cases the flood points of the columns were not determined although it is obvious that some have higher allowable throughputs than the Stedman packed column of corresponding diameter. Considering the above, it is believed that the Stedman packed column offers a better combination of operating characteristics for close fractionation in all except a few special cases. Stedman packing also seems to be the only packing material offering a large number of theoretical plates per foot of height in the larger diameters.

Acknowledgment

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TABLE I. TEST DATA

Reflux Rate R	Friction Loss F	Holdup H	Theoretical Plates in Col. Per Ft. P	H.E.T.P. Inches	Capacity Factor S	Holdup Factor W	Friction Loss Factor D	Work Factor C	Wire Cloth Factor B	Wire Cloth Work Factor E
Empty Column 0.1875-Inch Diameter, A = 0.0276 Sq. In.										
	2F		2P							
0.024	0.03	.....	7.0	3.4	0.9	....	0.004	3.2	.....	.....
0.029	0.05	.....	6.6	3.6	1.1	....	0.008	3.6	.....	.....
0.037	0.07	.....	6.4	3.7	1.3	....	0.011	4.2	.....	.....
0.061	0.15	.....	5.9	4.1	2.2	....	0.025	6.5	.....	.....
0.066	0.10	.....	5.7	4.2	2.4	....	0.018	6.8	.....	.....
0.092	0.20	.....	5.4	4.4	3.3	....	0.037	8.9	.....	.....
0.170	0.30	.....	5.1	4.7	6.2	....	0.059	15.8	.....	.....
Empty Column 0.3125-Inch Diameter, A = 0.0768 Sq. In.										
	2F		2P							
0.026	0.05	.....	8.8	2.7	0.34	...	0.006	1.5	.....	.....
0.033	0.05	.....	6.3	3.8	0.43	...	0.008	1.3	.....	.....
0.040	0.08	.....	5.3	4.5	0.52	...	0.015	1.4	.....	.....
0.059	0.13	.....	4.4	5.5	0.77	....	0.030	1.7	.....	.....
0.073	0.13	.....	3.8	6.3	0.95	....	0.034	1.8	.....	.....
0.092	0.15	.....	3.3	7.3	1.2	....	0.045	2.0	.....	.....
0.151	0.20	.....	3.2	7.5	2.0	...	0.063	3.2	.....	.....
0.182	....	.....	2.4	10.0	2.4	....	.....	2.9	.....	.....
0.261	....	.....	3.5	6.9	3.4	....	.....	5.9	.....	.....
Empty Column 0.375-Inch Diameter, A = 0.111 Sq. In.										
			2P							
0.026	....	.....	9.2	2.6	0.23	...	.....	1.1	.....	.....
0.033	....	.....	8.8	2.7	0.30	...	.....	1.3	.....	.....
0.040	....	.....	6.2	3.9	0.36	...	.....	1.1	.....	.....
0.046	....	.....	5.3	4.5	0.41	...	.....	1.1	.....	.....
0.053	....	.....	4.2	5.7	0.48	...	.....	1.0	.....	.....
Empty Column 0.750-Inch Diameter, A = 0.442 Sq. In.										
			2P							
0.040	....	.....	9.0	2.7	0.09	....	.....	0.40	.....	.....
0.053	....	.....	6.4	3.8	0.11	....	.....	0.35	.....	.....
0.066	....	.....	4.3	5.6	0.15	....	.....	0.32	.....	.....
0.066	....	.....	4.4	5.5	0.15	....	.....	0.33	.....	.....
0.119	....	.....	1.2	20.	0.27	....	.....	0.16	.....	.....
0.132	....	.....	1.3	18.5	0.30	....	.....	0.20	.....	.....
0.185	....	.....	1.2	20.	0.42	....	.....	0.25	.....	.....
0.238	....	.....	1.0	24.	0.54	....	.....	0.27	.....	.....
Empty Column 0.984-Inch Diameter, A = 0.760 Sq. In.										
			2P							
0.040	....	.....	12.5	1.8	0.053	...	.....	0.33	.....	.....
0.053	....	.....	10.3	2.3	0.070	....	.....	0.36	.....	.....
0.092	....	.....	2.7	8.9	0.121	...	.....	0.16	.....	.....
0.132	....	.....	1.7	14.	0.174	....	.....	0.15	.....	.....
0.185	....	.....	1.7	14.	0.243	....	.....	0.21	.....	.....
0.211	....	.....	1.6	15.	0.278	....	.....	0.22	.....	.....
0.238	....	.....	1.6	15.	0.313	....	.....	0.25	.....	.....
Empty Column 2.080-Inch Diameter, A = 3.40 Sq. In.										
	4F		4P							
0.5	....	.....	1.7	28.	0.15	....	.. ....	0.064	.....	.....
0.7	....	.....	1.5	32.	0.21	....	.....	0.079	.....	.....
1.0	..	.....	1.2	40.	0.29	....	.....	0.087	.....	.....
1.5	..	.....	1.0	48.	0.44	....	.....	0.11	.....	.....
2.0	0.17	.....	0.8	60.	0.59	....	0.21	0.12	.....	.....
3.0	0.20	.....	0.7	69.	0.88	....	0.29	0.15	.....	.....
4.0	0.25	.....	0.6	80.	1.2	....	0.42	0.18	.....	.....
6.0	..	.....	0.5	96.	1.8	....	.....	0.23	.....	.....
7.5	0.40	.....	0.4	120.	2.2	....	1.0	0.22	.....	.....
9.0	0.50	.....	0.4	120.	2.6	....	1.3	0.26	.....	.....
Empty Column 3.080-Inch Diameter, A = 7.43 Sq. In.										
	4F		4P							
0.5	0.04	.....	1.8	27.	0.07	....	0.022	0.032	.....	.....
2.0	..	.....	1.6	30.	0.27	..	.....	0.11	.....	.....
4.0	0.10	.....	1.1	44.	0.54	....	0.091	0.15	.....	.....
7.0	0.15	.....	0.8	60.	0.94	....	0.19	0.19	.....	.....
10.0	0.20	.....	0.8	60.	1.35	....	0.25	0.27	.....	.....
Empty Column 6.080-Inch Diameter, A = 29.0 Sq. In.										
	4F		4P							
5	....	.....	1.8	27.	0.17	...	.....	0.076	.....	.....
10	..	.....	1.0	48.	0.34	..	.....	0.085	.....	.....
12.5	0.20	.....	0.9	53.	0.43	....	0.22	0.097	.....	.....
20	....	.....	0.9	53.	0.69	....	.....	0.16	.....	.....
24	....	.....	0.6	80.	0.83	....	.....	0.12	.....	.....
Packing 105, 0.375-Inch Diameter, A = 0.111 Sq. In.										
									178 Sh./Ft.	
	2F	2H	2P							
0.024	0.05	.....	20.0	1.20	0.22	....	0.0025	2.2	0.056	0.012
0.026	0.05	.....	32.6	0.74	0.23	....	0.0015	3.7	0.092	0.021
0.029	0.10	0.0015	41.6	0.58	0.26	1.2	0.0024	5.4	0.12	0.031
0.034	0.80	0.0020	53.6	0.45	0.31	1.1	0.015	8.3	0.15	0.047
0.037	1.2	0.0019	56.4	0.42	0.32	0.9	0.021	9.0	0.16	0.051
0.040	2.2	0.0021	56.4	0.42	0.36	0.9	0.039	10.	0.16	0.058
0.045	2.4	0.0021	53.3	0.45	0.41	0.9	0.045	11.	0.15	0.061
0.045	2.75	.....	52.2	0.46	0.41	...	0.053	11.	0.15	0.061
0.048	3.5	0.0022	49.9	0.48	0.43	0.9	0.070	11.	0.14	0.060
0.050	4.0	0.0023	44.8	0.54	0.45	1.0	0.089	10.	0.13	0.058
0.053	4.2	0.0023	44.2	0.54	0.48	1.0	0.095	11.	0.12	0.058
0.055	4.9	0.0023	41.5	0.58	0.50	1.0	0.13	10.	0.12	0.060
0.056	5.0	0.0022	40.9	0.59	0.50	1.0	0.12	10.	0.12	0.060
0.058	7.0	0.0029	39.9	0.60	0.52	1.3	0.18	10.	0.11	0.057
0.059	6.5	0.0024	39.1	0.61	0.53	1.0	0.17	10.	0.11	0.058
0.061*	7.0	0.0032	37.7	0.64	0.55	1.4	0.19	10.	0.11	0.060
0.063	11.0	0.0048	31.8	0.75	0.57	2.4	0.35	9.0	0.089	0.051
0.066	17.0	0.0081	32.5	0.74	0.59	3.8	0.52	9.6	0.091	0.054
0.069	7.35	.....	41.7	0.58	0.62	....	0.18	13.	0.12	0.074
0.073†	26.0	0.0126	26.5	0.90	0.66	6.5	0.98	8.8	0.074	0.049

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Reflux Rate R	Friction Loss F	Holdup H	Theoretical Plates in Col. Per Ft. P	H.E.T.P. Inches	Capacity Factor S	Holdup Factor W	Friction Loss Factor D	Work Factor C	Wire Cloth Factor B	Wire Cloth Work Factor E
Packing 104, 0.750-Inch Diameter, A = 0.442 Sq. In.										
									98 Sh./Ft.	
	2F	2H	2P							
0.026	0.08	0.0023	43.2	0.56	0.059	2.0	0.0019	1.3	0.22	0.013
0.033	0.20	0.0028	48.0	0.50	0.075	1.8	0.0042	1.8	0.25	0.019
0.040	0.25	0.0028	50.3	0.48	0.090	1.4	0.0050	2.3	0.26	0.023
0.046	0.40	0.0028	49.5	0.48	0.10	1.2	0.0081	2.5	0.25	0.025
0.053	0.65	0.0045	48.3	0.50	0.12	1.8	0.014	2.9	0.25	0.030
0.079	1.25	0.0048	42.7	0.56	0.18	1.4	0.029	3.8	0.22	0.040
0.106	4.5	0.0055	36.7	0.65	0.24	1.4	0.12	4.4	0.19	0.046
0.132	6.2	0.0056	33.7	0.71	0.30	1.3	0.18	5.0	0.17	0.051
0.158	7.4	0.0065	30.6	0.78	0.36	1.3	0.24	5.5	0.16	0.058
0.168*	9.0	.	27.8	0.86	0.38	...	0.32	5.3	0.14	0.053
0.172	18.5	0.0123	24.4	0.98	0.39	2.9	0.76	4.8	0.13	0.051
0.178†	22.5	0.0216	20.6	1.16	0.40	5.9	1.1	4.1	0.11	0.044
Packing 112, 0.984-Inch Diameter, A = 0.760 Sq. In.										
									72 Sh./Ft.	
	2F	2H	2P							
0.034	0.08	0.0022	38.7	0.64	0.045	1.7	0.0021	0.87	0.27	0.012
0.040	0.10	0.0024	48.4	0.50	0.053	1.2	0.0021	1.3	0.34	0.018
0.042	0.10	.	48.0	0.50	0.055	..	0.0021	1.3	0.33	0.018
0.053	0.20	0.0034	43.8	0.55	0.070	1.5	0.0046	1.5	0.30	0.021
0.066	0.35	0.0038	41.0	0.59	0.087	1.4	0.0085	1.8	0.29	0.025
0.074	0.45	0.0045	38.7	0.62	0.097	1.6	0.012	1.9	0.27	0.026
0.079	0.55	.	38.5	0.62	0.104	..	0.014	2.0	0.27	0.028
0.106	0.90	0.0059	34.8	0.69	0.139	1.6	0.026	2.4	0.24	0.033
0.127	1.2	..	33.0	0.73	0.167	..	0.036	2.8	0.23	0.038
0.132	1.6	0.0063	31.1	0.77	0.174	1.5	0.051	2.7	0.22	0.038
0.158	2.5	..	31.1	0.77	0.208	.	0.080	3.7	0.22	0.046
0.185	3.4	0.0071	29.5	0.81	0.243	1.3	0.12	3.6	0.21	0.051
0.211	4.8	..	28.2	0.85	0.278	...	0.17	3.9	0.20	0.056
0.238	6.5	0.0087	26.3	0.91	0.313	1.4	0.25	4.1	0.18	0.056
0.264	8.5	0.0090	24.6	0.98	0.348	1.4	0.35	4.3	0.17	0.059
0.280	9.5	.	24.2	0.99	0.368	..	0.39	4.5	0.17	0.063
0.286*	9.5	0.0095	24.2	0.99	0.376	1.4	0.39	4.5	0.17	0.064
0.298	11.0	0.0219	25.5	0.94	0.392	2.9	0.43	5.0	0.18	0.070
0.306	9.5	.	26.3	0.91	0.403	.	0.36	5.3	0.18	0.073
0.317	10.9	0.0103	26.1	0.92	0.417	1.2	0.42	5.4	0.18	0.075
0.324	12.2	.....	25.7	0.93	0.426	..	0.48	5.5	0.17	0.073
0.330	16.3	0.0206	27.7	0.87	0.434	2.3	0.59	6.0	0.19	0.082
0.343†	19.0	0.0390	20.5	1.17	0.451	3.9	0.93	4.6	0.14	0.063
Packing 128, 2.080-Inch Diameter, A = 3.40 Sq. In.										
									100 Sh./Ft.	
	3F	3H	3P							
0.4	0.20	0.08	13.9	2.59	0.12	14.	0.014	0.56	0.046	0.0055
0.5	0.25	0.05	38.3	0.94	0.15	2.6	0.0065	1.9	0.128	0.019
0.6	0.30	0.08	39.0	0.92	0.18	3.4	0.0077	2.3	0.130	0.023
0.75	0.50	0.05	36.7	0.98	0.22	1.8	0.014	2.7	0.122	0.027
1.1	1.25	0.11	30.9	1.17	0.32	3.2	0.040	3.3	0.103	0.033
1.5	2.5	0.16	26.9	1.34	0.44	3.9	0.093	3.9	0.090	0.040
1.5	2.5	0.11	27.5	1.31	0.44	2.6	0.091	4.0	0.092	0.041
2.0	5.0	0.24	25.1	1.44	0.59	4.7	0.20	4.9	0.084	0.050
2.0	5.0	0.18	25.2	1.43	0.59	3.7	0.20	5.0	0.084	0.050
2.5	8.0	0.28	22.2	1.62	0.74	5.2	0.36	5.5	0.074	0.055
2.5	8.0	0.26	22.3	1.61	0.74	4.7	0.36	5.5	0.074	0.055
2.75*	9.5	0.21	....	....	0.81	...	....	...	.....	.....
3.0	11.5	0.37	21.0	1.71	0.88	5.8	0.55	6.2	0.070	0.062
3.25	13.0	0.40	21.1	1.70	0.96	5.8	0.62	6.7	0.070	0.067
3.5	14.0	0.32	22.2	1.62	1.1	4.1	0.63	8.1	0.074	0.081
4.0	20.0	0.40	22.4	1.61	1.2	4.4	0.89	9.0	0.075	0.090
4.5	26.0	0.45	23.5	1.53	1.3	4.3	1.1	10.	0.078	0.10
4.75	31.0	0.53	19.5	1.85	1.4	5.7	1.6	9.1	0.065	0.091
5.0†	35.0	1.06	16.6	2.17	1.5	12.8	2.1	8.3	0.055	0.083
Packing 107, 3.080-Inch Diameter, A = 7.43 Sq. In.										
									99 Sh./Ft.	
	3F	3H	3P							
0.5	0.10	0.05	25.2	1.43	0.067	4.0	0.0040	0.56	0.085	0.0057
0.65	0.12	0.05	33.2	1.08	0.087	2.3	0.0036	0.97	0.112	0.0097
0.75	0.17	0.08	32.5	1.11	0.10	3.3	0.0052	1.1	0.109	0.011
1.0	0.25	0.11	30.1	1.19	0.13	3.6	0.0083	1.3	0.101	0.013
1.5	0.55	0.26	27.3	1.32	0.20	6.4	0.020	1.8	0.092	0.018
2.0	0.5	0.19	24.8	1.45	0.27	3.8	0.020	2.2	0.083	0.022
2.5	1.5	0.40	24.0	1.50	0.34	6.6	0.063	2.7	0.081	0.028
3.0	1.5	0.26	23.3	1.55	0.40	3.8	0.064	3.1	0.078	0.031
3.0	1.5	0.26	23.2	1.55	0.40	3.7	0.065	3.1	0.078	0.031
4.0	3.0	0.21	22.2	1.62	0.54	2.4	0.13	4.0	0.075	0.041
4.5	4.0	0.26	21.8	1.65	0.61	2.7	0.18	4.4	0.073	0.045
5.0	5.5	0.29	21.2	1.70	0.67	2.7	0.26	4.7	0.071	0.048
6.0	8.7	0.34	20.2	1.78	0.81	2.8	0.43	5.5	0.068	0.055
6.8*	10.0	0.40	19.4	1.86	0.91	3.0	0.52	5.9	0.065	0.059
7.5	13.5	0.26	20.4	1.76	1.01	1.7	0.66	6.9	0.069	0.070
8.0	20.0	0.34	22.0	1.64	1.08	1.9	0.91	7.9	0.074	0.080
8.5	28.0	0.54	21.5	1.68	1.14	3.0	1.3	8.2	0.072	0.082
9.0	28.6	0.40	20.8	1.73	1.21	2.1	1.4	8.4	0.070	0.085
9.5	30.0	0.78	19.5	1.85	1.28	4.2	1.5	8.3	0.066	0.085
10.0	34.0	1.21	16.6	2.16	1.35	7.3	2.0	7.5	0.056	0.076
10.2†	35.0	1.27	(15.6)	(2.30)	1.37	(8.0)	(2.2)	(7.1)	(0.053)	(0.073)
Packing 115, 6.080-Inch Diameter, A = 29.0 Sq. In.										
									100 Sh./Ft.	
	3F	3H	3P							
2.0	0.25	0.45	30.1	1.20	0.069	7.5	0.0083	0.69	0.100	0.0069
2.8	0.30	0.16	30.8	1.17	0.097	1.8	0.0097	1.0	0.103	0.010
3.5	0.50	0.18	30.5	1.18	0.12	1.7	0.016	1.2	0.102	0.012
5.0	0.50	0.40	26.5	1.36	0.17	3.0	0.019	1.5	0.088	0.015
5.2	0.50	0.16	26.1	1.38	0.18	1.2	0.019	1.6	0.087	0.016
8.2	1.3	0.32	23.7	1.52	0.29	1.6	0.055	2.3	0.079	0.023
10.0	1.6	0.45	22.5	1.60	0.34	2.0	0.071	2.5	0.075	0.026
10.0	1.6	....	23.2	1.55	0.34	..	0.069	2.6	0.077	0.026
12.5	3.0	0.61	22.3	1.61	0.43	2.2	0.13	3.2	0.074	0.032
13.5	3.25	0.53	21.8	1.65	0.47	1.8	0.15	3.4	0.073	0.034
15.0	3.5	0.66	20.6	1.75	0.52	2.1	0.17	3.6	0.069	0.036
17.5	5.5	0.74	20.2	1.78	0.60	2.1	0.27	4.1	0.067	0.040
20.0	6.3	0.66	18.8	1.91	0.69	1.8	0.33	4.3	0.063	0.044
20.0	6.7	0.79	17.9	2.01	0.69	2.2	0.37	4.1	0.060	0.041
22.5	7.0	1.19	17.7	2.03	0.78	3.0	0.39	4.6	0.059	0.046
23.5	9.5	....	17.3	2.08	0.81	...	0.55	4.7	0.058	0.047
24.0*	10.0	....	....	....	0.83	...	....	...	.....	.....
25.0	10.6	1.24	17.1	2.11	0.86	2.9	0.62	4.9	0.057	0.049
27.5	15.0	1.72	18.0	2.00	0.95	3.5	0.83	5.7	0.060	0.057
30.0	17.0	1.40	19.0	1.89	1.03	2.4	0.90	6.5	0.063	0.065
32.5	20.0	1.35	20.3	1.77	1.12	2.0	0.98	7.6	0.068	0.076
35.0	23.0	1.21	22.3	1.61	1.21	1.6	1.03	9.0	0.074	0.090
37.0	25.0	1.59	23.0	1.56	1.28	1.9	1.09	9.8	0.077	0.099
39.0	27.0	1.48	23.5	1.53	1.35	1.6	1.15	11.	0.078	0.105
41.0	30.0	2.06	22.2	1.62	1.41	2.3	1.35	10.	0.074	0.104
42.0†	30.0	1.80	(14.2)	(2.53)	1.45	(3.0)	(2.11)	(6.9)	(0.047)	(0.069)
Packing 116, 12-Inch Hexagon, A = 93.6 Sq. In.										
									99 Sh./Ft.	
	2F	2H	2P							
12.0	0.25	0.55	16.1	1.49	0.13	2.8	0.016	1.0	0.081	0.011
15.0	0.30	0.40	16.7	1.44	0.16	1.6	0.018	1.3	0.084	0.013
20.0	0.50	0.55	15.2	1.58	0.21	1.8	0.033	1.6	0.077	0.016
30.0	1.00	0.63	13.2	1.82	0.32	1.6	0.076	2.1	0.067	0.021
30.0	1.00	1.06	13.2	1.82	0.32	2.7	0.076	2.1	0.067	0.021
30.0	1.00	0.48	13.0	1.85	0.32	1.2	0.077	2.1	0.066	0.021
40.0	1.75	0.53	12.1	1.98	0.43	1.1	0.145	2.6	0.061	0.026
50.0	2.50	0.63	11.7	2.05	0.53	1.1	0.21	3.1	0.059	0.031
60.0	3.90	0.69	11.3	2.12	0.64	1.0	0.35	3.6	0.057	0.036
70.0	5.00	0.79	10.8	2.22	0.75	1.0	0.46	4.0	0.055	0.041
80.0	6.30	0.92	10.1	2.38	0.85	1.1	0.62	4.3	0.051	0.043
85.0	6.90	0.92	9.8	2.45	0.91	1.1	0.70	4.5	0.049	0.045
90.0	8.00	1.00	9.7	2.46	0.96	1.1	0.83	4.6	0.049	0.047
90.0	7.90	0.92	9.5	2.52	0.96	1.1	0.83	4.5	0.048	0.046
93.0*	8.6	....	....	....	0.99	...	....	...	.....	.....
95.0	9.00	1.11	10.2	2.35	1.0	1.1	0.88	5.1	0.052	0.052
100.0	10.0	1.22	11.2	2.14	1.1	1.1	0.89	6.2	0.057	0.063
110.0	12.7	1.48	11.6	2.07	1.2	1.1	1.1	7.0	0.059	0.071
120.0	17.0	1.85	11.7	2.05	1.3	1.3	1.5	7.6	0.059	0.077
130.0	24.0	3.96	11.3	2.12	1.4	2.7	2.1	7.9	0.057	0.080
138.0	32.0	5.02	11.0	2.18	1.5	3.3	2.9	8.3	0.056	0.084
140.0†	36.0	4.73	10.7	2.24	1.5	3.2	3.4	8.0	0.054	0.081
140.0†	36.0	4.73	(8.6)	(2.78)	1.5	(4.0)	(4.2)	(6.5)	(0.044)	(0.065)

*Initial flood point of column. †Column completely flooded.

TABLE II. DATA FROM LITERATURE

Reflux Rate R	Friction Loss F	Holdup H	Theoretical Plates in Col. Per Ft. P	H.E.T.P. Inches	Capacity Factor S	Holdup Factor W	Friction Loss Factor D	Work Factor C
Empty Column[11], 0.118-Inch Diameter, A = 0.0109 Sq. In.								
0.009	.....	.....	9.5	1.3	0.8	.....	.....	7.6
0.013	.....	.....	7.0	1.7	1.1	.....	.....	7.7
0.016	.....	.....	6.0	2.0	1.4	.....	.....	8.4
0.021	.....	.....	3.0	4.0	1.8	.....	.....	5.4
0.025	.....	.....	4.0	3.0	2.1	.....	.....	8.3
0.032	.....	.....	2.0	6.0	2.7	.....	.....	5.4
0.048	.....	.....	1.0	12.0	4.1	.....	.....	4.1
Empty Column[11], 0.236-Inch Diameter, A = 0.0438 Sq. In.								
0.0026	....	.....	17.5	0.69	0.06	.....	.....	1.1
0.0034	.....	.....	13.0	0.92	0.07	.....	.....	0.9
0.0071	.....	.....	6.0	2.0	0.15	.....	.....	0.9
0.013	.....	.....	4.0	3.0	0.27	.....	.....	1.1
0.014	.....	.....	2.0	6.0	0.29	.....	.....	0.6
0.022	.....	.....	2.0	6.0	0.46	.....	.....	0.9
0.030	.....	.....	2.0	6.0	0.63	.....	.....	1.3
0.040	.....	.....	1.0	12.	0.84	.....	.....	0.8
0.079	.....	.....	1.0	12.	1.7	.....	.....	1.7
0.098	.....	.....	0.5	24.	2.1	.....	.....	1.1
0.127	.....	.....	0.5	24.	2.7	.....	.....	1.4
Concentric Glass Tube Column[12], A = 0.16 Sq. In. Equivalent Diameter = 0.451 Inches								
	4.7F	4.7H	4.7P					
0.026	0.12	.....	84.9	0.67	0.13	.....	0.0021	2.4
0.051	0.14	.....	97.2	0.59	0.26	.....	0.0021	5.4
0.062	0.17	.....	76.7	0.74	0.31	.....	0.0033	5.1
0.067	0.19	0.0021	69.0	0.82	0.34	0.45	0.0041	5.0
0.022	0.10	0.00098	89.4	0.64	0.11	0.50	0.0017	2.1
0.032	0.12	0.0014	79.6	0.72	0.16	0.55	0.0022	2.7
0.033	0.13	.....	64.9	0.88	0.16	.....	0.0030	2.2
0.048	0.15	.....	72.2	0.79	0.24	.....	0.0031	3.7
0.055	0.19	.....	75.5	0.76	0.27	.....	0.0037	4.3
Bubble-Cap Column[6], 0.984-Inch Diameter, A = 0.760 Sq. In. 2 Centimeter Sections								
	0.33F	0.33H	0.33P					
0.081	.....	0.00092	5.4	0.73	0.10	2.1	.....	1.6
0.16	.....	0.00092	4.8	0.82	0.19	1.2	.....	2.8
0.34	.....	0.00092	3.7	1.1	0.41	0.73	.....	4.6
0.040	.....	0.00092	4.9	0.80	0.042	4.7	.....	0.62
0.081	.....	0.00092	4.7	0.84	0.084	2.4	.....	1.2
0.16	.....	0.00092	4.3	0.92	0.17	1.3	.....	2.2
0.32	.....	0.00092	3.8	1.0	0.33	0.76	.....	3.8
4 Centimeter Sections								
	0.66F	0.66H	0.66P					
0.071	.....	0.0018	4.4	1.8	0.085	5.8	.....	0.57
0.16	.....	0.0018	4.2	1.9	0.19	2.7	.....	1.2
0.39	.....	0.0018	3.7	2.1	0.47	1.2	.....	2.6
0.057	.....	0.0018	5.1	1.5	0.068	6.2	.....	0.53
0.12	.....	0.0018	4.7	1.7	0.12	3.2	.....	0.86
0.19	.....	0.0018	4.4	1.8	0.20	2.3	.....	1.3
0.33	.....	0.0018	4.2	1.9	0.34	1.3	.....	2.2
0.49	.....	0.0018	4.0	2.0	0.51	0.9	.....	3.1

Reflux Rate R	Friction Loss F	Holdup H	Theoretical Plates in Col. Per Ft. P	H.E.T.P. Inches	Capacity Factor S	Holdup Factor W	Friction Loss Factor D	Work Factor C
			8 Centimeter Sections					
	1.31F	1.31H	1.31P					
0.076	.....	0.0058	5.7	2.8	0.091	13.	.....	0.40
0.33	.....	0.0058	4.9	3.2	0.39	3.6	.....	1.5
0.12	.....	0.0058	5.0	3.1	0.12	10.	.....	0.46
0.35	.....	0.0058	5.0	3.1	0.36	3.3	.....	1.4
0.46	.....	0.0058	4.6	3.4	0.48	2.7	.....	1.7
	One Turn Glass Helices[19], Diameter 0.394-Inch, A = 0.122 Sq. In.							
	1.33F	1.33H	1.33P					
0.029	.....	.....	12.5	1.4	0.20	.....	.....	1.9
0.034	.....	.....	12.5	1.4	0.23	.....	.....	2.2
0.063	.....	0.0021	11.5	1.55	0.43	2.9	.....	3.7
0.095	.....	.....	12.5	1.4	0.65	.....	.....	6.1
0.108	.....	.....	11.5	1.55	0.74	.....	.....	6.4
0.108	.....	.....	11.5	1.55	0.74	.....	.....	6.4
0.108	.....	.....	11.5	1.55	0.74	.....	.....	6.4
0.111	.....	.....	11.5	1.55	0.76	.....	.....	6.6
0.111	.....	.....	12.0	1.45	0.76	.....	.....	6.8
0.111	.....	.....	11.5	1.55	0.76	.....	.....	6.6
	4 mm. x 6 mm. — 0.5 mm. Carding Teeth[19] Diameter 1.26-Inch, A = 1.25 Sq. In.							
	9.0F	9.0H	9.0P					
0.48	3.7	.....	38.0	2.9	0.30	.....	0.14	1.3
0.53	3.7	.....	42.5	2.6	0.33	.....	0.13	1.6
0.55	3.5	.....	50.5	2.2	0.34	.....	0.10	1.9
0.58	2.7	.....	40.5	2.8	0.36	.....	0.10	1.6
0.61	4.3	.....	35.0	3.2	0.38	.....	0.18	1.5
1.21	19.8	.....	38.0	2.9	0.75	.....	0.77	3.2
1.27	23.6	.....	33.0	3.4	0.78	.....	1.1	2.9
1.32	19.3	.....	35.5	3.1	0.81	.....	0.81	3.2
	One Turn 5/32-Inch—No. 26 Wire Nickel Helices[19] Diameter 1.26-Inch, A = 1.25 Sq. In.							
	9.0F	9.0H	9.0P					
1.37	9.1	.....	21.5	5.3	0.84	.....	0.63	2.0
1.45	9.6	.....	20.5	5.5	0.89	.....	0.70	2.0
1.48	9.6	.....	22.0	5.1	0.91	.....	0.65	2.2
1.53	12.	.....	21.5	5.3	0.94	.....	0.83	2.2
1.56	9.1	.....	18.0	6.3	0.96	.....	0.75	1.9
1.58	12.	.....	29.0	3.9	0.97	.....	0.62	3.1
1.66	17.	.....	29.5	3.8	1.02	.....	0.86	3.3
	One Turn ⅛-Inch Diameter—No. 26 Wire Nickel Helices[8] Diameter 1.26-Inch, A = 1.25 Sq. In.							
	4.3F	4.3H	4.3P					
0.64	21	.....	94	5.3	0.39	.....	0.33	0.85
1.08	40	.....	98	5.0	0.66	.....	0.61	1.5
1.08	59	.....	116	4.3	0.66	.....	0.76	1.8
1.11	43	.....	122	4.1	0.67	.....	0.52	1.9
1.24	51	.....	98	5.0	0.75	.....	0.78	1.7
	Single Turn 3/32-Inch Diameter—No. 26 Wire Helices[18] Diameter 0.79-Inch, A = 0.49 Sq. In.							
	1.96F	1.96H	1.96P					
0.079	.....	.....	22.0	1.07	0.12	.....	.....	1.3
0.095	.....	.....	22.5	1.04	0.15	.....	.....	1.7
0.21	.....	.....	17.5	1.34	0.33	.....	.....	3.0
0.30	.....	.....	18.5	1.27	0.47	.....	.....	4.4
0.36	.....	.....	16.0	1.47	0.57	.....	.....	4.7
	9.25F	9.25H	9.25P					
0.074	.....	.....	100	1.11	0.12	.....	.....	1.3
0.17	7.5	.....	100	1.11	0.27	.....	0.11	2.9
0.23	.....	.....	113	0.98	0.36	.....	.....	4.4
0.24	9.6	.....	103	1.08	0.38	.....	0.14	4.2
0.29	10.7	.....	101	1.10	0.46	.....	0.16	5.0
0.33	.....	.....	102	1.09	0.52	.....	.....	5.7
	Column Diameter 2.0-Inch[7], A = 3.14 Sq. In. ½ x ½ Inch Carbon Raschig Rings							
	8.5F	8.5H	8.5P					
3.54	5.9	.....	14.5	7.0	0.87	.....	0.61	1.5
2.3	3.2	.....	13.5	7.5	0.56	.....	0.35	0.90
0.77	0.5	.....	12.5	8.2	0.19	.....	0.06	0.28
	½ x ½ Inch Stoneware Raschig Rings							
2.3	2.1	.....	13.5	7.5	0.56	.....	0.23	0.89
4.5	9.1	.....	17.	6.0	1.1	.....	0.80	2.2
	⅜ x ⅜ Inch Stoneware Raschig Rings							
2.0	7.5	.....	18.	5.7	0.49	.....	0.62	1.0
0.85	0.5	.....	14.5	7.0	0.21	.....	0.05	0.36
1.3	1.1	.....	15.5	6.6	0.32	.....	0.11	0.58
1.7	2.1	.....	15.5	6.6	0.42	.....	0.20	0.77
0.37	0.3	.....	16.5	6.2	0.091	.....	0.027	0.18
2.7	4.3	.....	15.5	6.6	0.66	.....	0.41	1.2
2.1	7.5	.....	19.	5.4	0.52	.....	0.59	1.2
0.26	.....	.....	16.	6.4	0.064	.....	.....	0.12
1.1	1.6	.....	15.	6.8	0.27	.....	0.16	0.48
	¼ x ¼ Inch Carbon Raschig Rings							
1.3	14.	.....	21.5	4.7	0.32	.....	1.0	0.81
1.1	9.	.....	19.	5.4	0.27	.....	0.7	0.60
0.85	5.	.....	20.	5.1	0.21	.....	0.4	0.49
0.45	2.	.....	20.5	5.0	0.11	.....	0.1	0.27
	½ Inch Clay Berl Saddles							
3.67	.....	.....	18.	5.7	0.90	.....	.....	1.9
3.20	.....	.....	15.5	6.6	0.79	.....	.....	1.4
2.24	.....	.....	14.5	7.0	0.55	.....	.....	0.94
1.95	.....	.....	14.5	7.0	0.48	.....	.....	0.82
0.90	.....	.....	14.5	7.0	0.22	.....	.....	0.38
0.16	.....	.....	13.5	7.5	0.039	.....	.....	0.062
4.25	.....	.....	18.	5.7	1.0	.....	.....	2.1
3.90	.....	.....	17.5	5.8	0.96	.....	.....	2.0

Reflux Rate R	Friction Loss F	Holdup H	Theoretical Plates in Col. Per Ft. P	H.E.T.P. Inches	Capacity Factor S	Holdup Factor W	Friction Loss Factor D	Work Factor C
			Six-Mesh Carborundum					
0.58	5.	.....	51.	2.0	0.14	.....	0.14	0.84
0.98	27.	.....	57.	1.8	0.24	.....	0.70	1.6
1.03	42.	.....	60.	1.7	0.25	.....	1.0	1.8
0.24	2.	.....	62.	1.6	0.059	.....	0.05	0.43
	¼ Inch I.D. Aluminum Single-Turn Helices							
5.2	.....	.....	17.	6.0	1.3	.....	.....	2.6
5.6	.....	.....	17.5	5.8	1.4	.....	.....	2.9
	3/16 Inch I.D. Aluminum Single-Turn Helices							
3.2	4.	.....	19.	5.4	0.79	.....	0.3	1.8
5.3	14.	.....	23.5	4.3	1.3	.....	0.9	3.6
5.1	12.	.....	26.5	3.8	1.3	.....	0.7	4.1
4.5	9.6	.....	27.5	3.7	1.1	.....	0.5	3.6
	5/32 Inch I.D. Nickel Single-Turn Helices							
4.7	13.	.....	28.5	3.6	1.2	.....	0.7	4.0
4.2	12.	.....	32.5	3.1	1.0	.....	0.6	3.8
2.6	5.	.....	32.5	3.1	0.64	.....	0.2	2.4
	⅛ Inch I.D. Nickel Single-Turn Helices							
2.6	.....	.....	45.	2.3	0.64	.....	.....	3.4
	3/32 Inch I.D. Stainless-Steel Single-Turn Helices							
2.0	12.	.....	44.	2.3	0.49	.....	0.41	2.5
1.2	7.	.....	51.	2.0	0.29	.....	0.20	1.7
0.53	2.	.....	68.	1.5	0.13	.....	0.04	1.0
2.9	20.	.....	46.	2.2	0.71	.....	0.65	3.8
1.2	6.4	.....	53.	1.9	0.29	.....	0.18	1.8
	⅛ x 7/32 Inch Carding Teeth							
3.9	25.	.....	40.	2.5	0.96	.....	0.93	4.5
3.5	20.	.....	41.5	2.5	0.86	.....	0.72	4.2
2.7	10.	.....	46.5	2.2	0.66	.....	0.32	3.6
2.4	8.	.....	47.5	2.1	0.59	.....	0.25	3.3
1.9	5.	.....	49.5	2.1	0.47	.....	0.15	2.7
1.6	4.	.....	51.	2.0	0.39	.....	0.12	2.3
1.2	3.	.....	52.	2.0	0.29	.....	0.09	1.8
	3-6 Mesh Silicon Carbide[6], 1.24-Inch Diameter, A = 1.21 Sq. In.							
	4.9F	4.9H	4.9P					
1.2*	.....	.....	30.	2.9	1.0	.....	.....	4.1
	Spinning-Band Column[1], 0.26-Inch Diameter, A = 0.053 Sq. In.							
	17.9F	17.9H	17.9P					
0.043	.....	0.0019	70	3.1	0.56	0.63	.....	2.2
0.079*	.....	.....	48	4.5	1.0	.....	.....	2.7
	Spiral Screen Packing[16], 0.75-Inch Diameter, 67 Turns/Ft., A = 0.393 Sq. In. Cupped Spiral No. 4, Equivalent Diameter = 0.708 Inches							
0.0053	.....	.....	21.8	0.55	0.010	.....	.....	0.22
0.022	.....	0.0012	17.8	0.67	0.042	2.9	.....	0.75
0.050	Approx. 0.53	0.0014	17.7	0.68	0.095	1.6	0.04	1.7
0.086	.....	0.0017	17.7	0.68	0.16	1.1	.....	2.8
0.137	.....	0.0024	17.0	0.71	0.26	1.0	.....	4.4
0.197	.....	0.0053	13.4	0.90	0.38	1.9	.....	5.1
	Spiral Screen Packing[16], 0.75-Inch Diameter, 72 Turns/Ft., A = 0.393 Sq. In. Collapsed Tube No. 3, Equivalent Diameter = 0.708 Inches							
0.0066	.....	.....	22.6	0.54	0.013	.....	.....	0.29
0.021	.....	.....	25.0	0.49	0.040	.....	.....	1.0
0.029	.....	.....	25.6	0.47	0.055	.....	.....	1.4
0.069	.....	.....	28.5	0.43	0.13	.....	.....	3.7
0.077	.....	.....	30.0	0.40	0.15	.....	.....	4.5
0.082	.....	.....	31.5	0.39	0.16	.....	.....	5.1
0.100	.....	.....	31.5	0.39	0.19	.....	.....	6.0
0.127	.....	.....	21.0	0.58	0.24	.....	.....	5.0
0.132	.....	.....	20.0	0.61	0.25	.....	.....	5.0
	Spiral Screen Packing[16], 0.5-Inch Diameter, 67 Turns/Ft., A = 0.175 Sq. In. Equivalent Diameter = 0.472 Inches							
0.0066	.....	.....	17.7	0.68	0.028	.....	.....	0.50
0.022	.....	0.0007	17.7	0.68	0.094	1.8	.....	1.7
0.057	.....	0.0009	17.7	0.68	0.24	0.9	.....	4.3
0.082	.....	0.0013	17.6	0.69	0.35	0.9	.....	6.2
0.099	.....	0.0019	16.5	0.74	0.42	1.2	.....	6.9

*Initial Flood Point of Column.

Benjamin T. Brooks, well-known New York petroleum consultant, is spending the greater part of this winter in Venezuela as special adviser to the government on petroleum matters.

Better Dust-Proof Coal

Further research on materials for the dust-proofing of coals, with particular attention to those porous coals now difficult to treat economically, is to be included in a $200,000-program of research at Battelle Memorial Institute, announced recently by Bituminous Coal Research, Inc., and sponsored by the National Coal Assn. Research is expected to broaden the distribution of coal that is clean to handle.

Research program is aimed to advance the competitive position of coal by the development of better equipment for its use in home and industry. Among problems to be attacked are the direct conversion of coal to mechanical energy in a new type of internal-combustion engine.

Get Cetane Numbers Quickly With New "Cetane Valve"

ABSTRACT

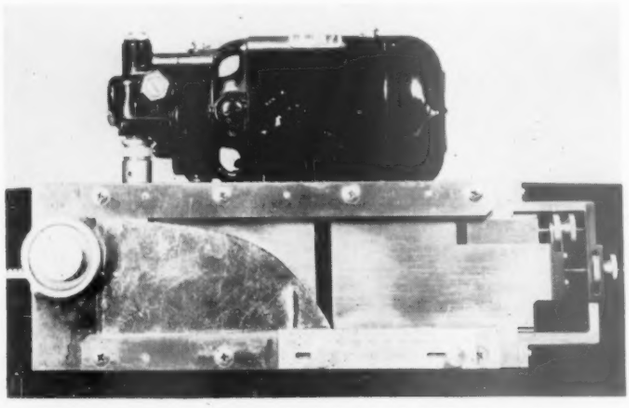
S.A.E. diesel engine instrumentation symposium brings out a number of kinks for the diesel engine test laboratory. Among these are the "cetane valve" enabling quick determinations of cetane number of diesel fuels on Caterpillar diesels and with possible adaptation to the C.F.R. test engine. The measurement of ignition lag by an improved electronic switch, a special mirror for photographing ports in the engine, and a strobotachometer using a 2-watt neon light were also described.

A "CETANE VALVE," a new instrument for determining cetane number of diesel fuel, was described in a symposium on diesel engine testing during the annual meeting of the Society of Automotive Engineers in Detroit, Jan. 6-10, from a paper by W. H. Browne, Caterpillar Tractor Co. The development of this instrument was undertaken because it was felt that the use of the cetane number as a measure of the ignition quality of diesel fuel required a simple, rapid, accurate, and reproducible method and instrument for its determination.

As present the cetane valve can be applied to the 5¾ x 8 Caterpillar test engine with most satisfactory results. Although not many applications have been made to other engines, work on the 3¾ x 5 engine was said to indicate that it can be adapted easily. Application to the C. F. R. test engine has not been completed satisfactorily because of difficulty in fixing the misfire point.

When using the method with the larger bore engine the misfire point was said to be definite, being signaled by a puff of visible smoke accompanied by an audible noise from the exhaust tap. In the C. F. R. engine the throttling of the cetane valve causes combustion to take place intermittently for a considerable period around the misfire point. It is hoped that this difficulty will be ironed out soon.

The "cetane valve" applies reduced intake pressure to ignition quality rating. It had been observed during attempts to rate diesel fuels for altitude operation that as intake pressure was reduced, the ignition lag increased until a point was reached where the engine misfired. The first use of this principle was made with a butterfly valve equipped with a graduated quadrant and placed in the intake of a Caterpillar one-cylinder test engine.



A new instrument for determining cetane number of diesel fuels by application of reduced intake pressure is this "cetane valve"

The present instrument, illustrated herewith has a straight-edged gate moved across an orifice of varying cross-section at slow, constant speed by an electric motor. A calibrator, consisting of a small shutter which varies the total area of the orifice, allows a scale of cetane number to be placed on the instrument.

Correlation between the cetane valve and teh coincident flash method was shown to be good. The ratings by the cetane valve are higher by approximately one number. The ratings of the pure cetane blends showed the standardization of the instrument to be good also it was said. The reproducibility of the instrument has also been proven. Speed and ease of operation was indicated by the fact that a single operator can easily rate 6 to 8 fuels per hour.

As far as accuracy is concerned, it was concluded that "some absolute standard must first be agreed upon before any method can be discussed from this standpoint. All the present methods of ignition quality rating can be standardized with reference fuels and still give differing results for commercial fuels."

Ignition Lag Measurement

Accurate measurement of ignition lag in the diesel engine was described in a paper by A. E. Traver and W. S. Mount, Socony-Vacuum Oil Co. The method is a refinement of that commonly used by a number of laboratories and was said to be particularly suited to measuring small differences between diesel fuels rather than to engine design. The meter described is essentially an electronic switch which is turned on by the voltage impulse from the first closure of the injection contact points. The current flow through the circuit during the "on" period is accumulated by a condenser which is continuously discharged through a micro-ammeter throughout the whole cycle of 720 degrees. Changes in ignition lag due to fuel quality are indicated as changes in the micro-ammeter reading but most cycle to cycle variations are damped out.

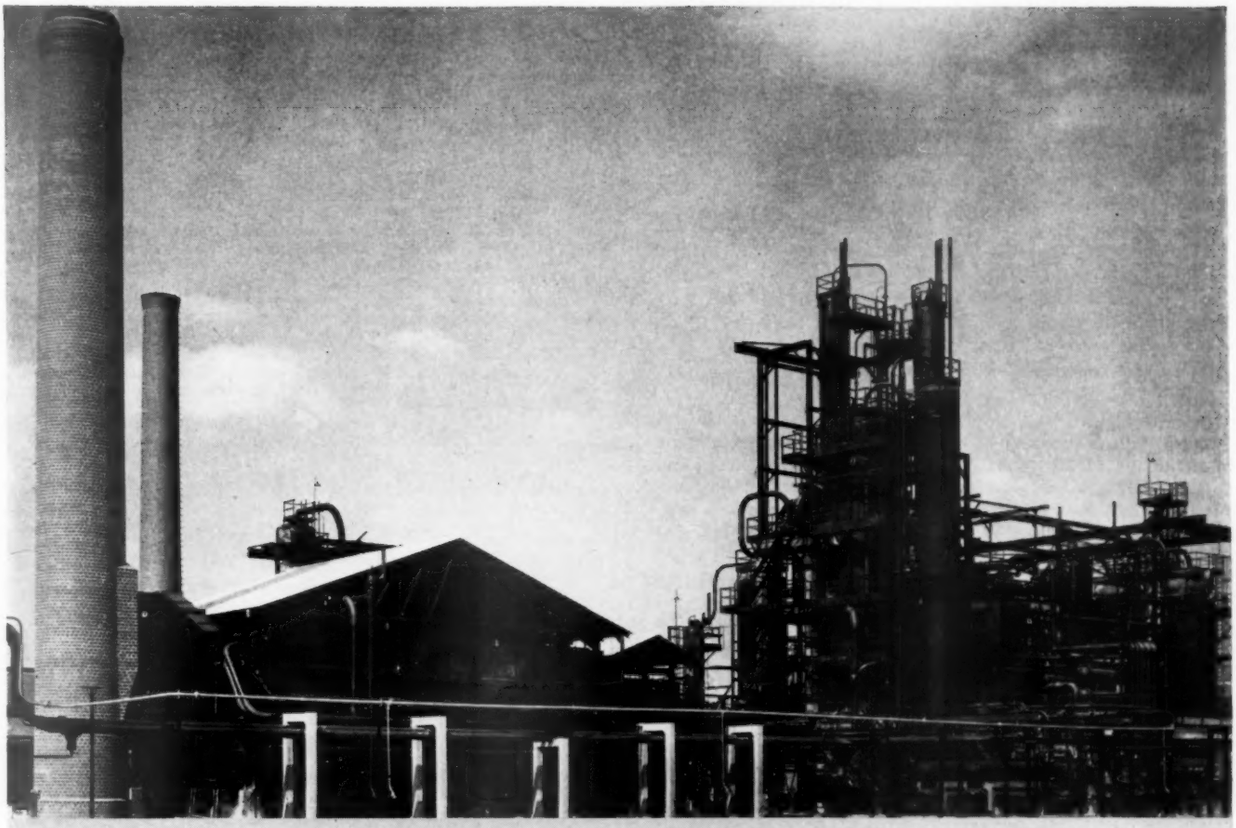
Propose Diesel Smoke Unit

In discussing the increasing importance of evaluating the density of smoke in the exhaust of a diesel engine, K. M. Brown, Caterpillar Tractor Co., proposed "a measure of smoke that would be independent of the smoke meter used." This unit is "smoke density per unit length of smoke column." He also proposed the standard length of smoke column be taken as 100 meters. The universal use of this smoke density scale would allow smoke readings to be interpreted the same by everyone.

Kinks in Diesel Testing

Two devices for improving laboratory precision of diesel fuel tests were described by L. W. Griffith from a paper by himself and E. R. Willerth, both of Shell Oil Co. The first is a conical mirror 3½ in. in diameter and with an outer surface making a 45° angle with the base, made with a polished metal reflecting surface. This mirror, placed on the piston in the cylinder, reflects an image of all ports so that they can be photographed by a camera placed vertically above the centerline of the cylinder.

The other device was a strobotachometer for checking engine speed. An ordinary 2-watt neon light, flashing 7200 times per minute on 60-cycle current, was fastened inside



Two More POLYFORM-GAS REVERSION UNITS *by* LUMMUS

Lummus is designing and building two Polyform-Gas Reversion units—one, 4600 barrels per day and the other, 7300 barrels per day of naphtha and outside propanes and butanes.

These are the thirteenth and fourteenth Polyform-Gas Reversion plants—including four now under construction by Lummus—with a total fresh feed charge of 67,000 barrels of naphtha, propanes and butanes.

Write for complete data on Polyform and Gas Reversion processes.

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LUMMUS

PETROLEUM REFINING PLANTS

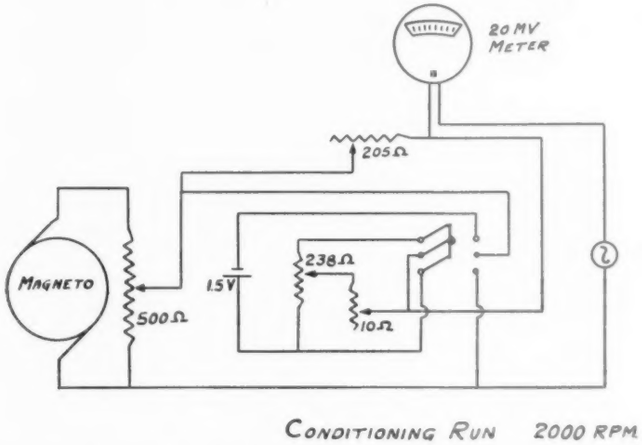
the flywheel guard adjacent to a hooded opening. The rim of the flywheel was divided into 12 equal spaces painted alternately white. If there is any deviation from 1200 rpm, the direction of the change can be detected by the direction of apparent slow motion of the flywheel. Other speeds, which are integral divisors of 7200 can be checked by changing the number of white spaces. If 7200 is not an even multiple of the engine speed a small drum can be geared to the most convenient speed. Where several speeds are employed several narrow bands can be marked on the flywheel or drum.

P. H. Schweitzer, Pennsylvania State College, discussed the use of the cathode ray oscillograph for routine testing injection systems and described briefly an electrical integrator employed with the oscillograph to enable use of electromagnetic pickups.

New Electric Tachometer

Improvement in the measurement and control of engine speed within narrow limits, a necessary requirement in the accurate testing of internal combustion engines, was offered in the form of a dual-range, vernier, electric tachometer. A paper describing this instrument was prepared by H. V. Nutt and W. F. Joachim, U. S. Naval Engineering Experiment Station.

The accompanying wiring diagram shows the essential parts. Accuracy of reading is said to be within one rpm. The particular value of the instrument is in checking accurately the deviation from a fixed speed rather than in obtaining absolute accuracy in measurement of speed. A special magneto having gold plated commutator and brushes is employed.



Dual-range vernier-electric tachometer wiring diagram

NEW PATENTS

Compiled by R. E. Burnham, patent and trade-mark attorney, 511 Eleventh Street, NW, Washington, D. C., from whom copies may be obtained at rate of 25c each. State number of patent and name of inventor when ordering.

November 26, 1940

Treatment of oils—E. T. Scafe, assignor to Socony-Vacuum Oil Co. Filed Feb. 2, 1939. No. 2,222,596.

Apparatus for controlled treatment of fluids—R. C. Lassiat, assignor to Houdry Process Corp. Filed Mar. 8, 1937. No. 2,222,623.

Dealkylation process—A. N. Sachanen and R. C. Hansford, assignors to Socony-Vacuum Oil Co. Filed Oct. 5, 1938. No. 2,222,632.

Separation of components of liquid mixtures—W. W. Aldinger, and W. A. Hall, assignors to Atlantic Refining Co. Filed Aug. 17, 1937. No. 2,222,645.

Vapor phase cracking system—A. E. Nash, assignor to Petroleum Conversion Corp. Filed Sept. 17, 1938. No. 2,222,682.

Process for dewaxing mineral oils—Sijbren Tijmstra and D. S. McKittrick, assignors to Shell Development Co. Filed June 20, 1936. No. 2,223,022.

Treatment of petroleum products—A. N. Sachanen and R. C. Hansford, assignors to Socony-Vacuum Oil Co. Filed Sept. 1, 1938. No. 2,223,133.

Refining of oil—A. C. Vobach, assignor to Sinclair Refining Co. Filed Apr. 10, 1937. No. 2,223,141.

Process for low temperature conversion of hydrocarbon oils—W. L. Benedict, assignor to Universal Oil Products Co. Filed Dec. 13, 1939. No. 2,223,162.

Isomerization of paraffin hydrocarbons—C. S. Lynch and J. E. Wood III, assignors to Standard Oil Development Co. Filed Dec. 29, 1939. No. 2,223,180.

Conversion of hydrocarbon oils—Kenneth Swartwood, assignor to Universal oil Products Co. Filed Jan. 19, 1935. No. 2,223,192.

Recovery of petroleum sulfonic compounds—K. M. Thompson, assignor to Atlantic Refining Co. Filed July 9, 1938. No. 2,223,194.

Treatment of hydrocarbon gases—Charles Wirth III, assignor to Universal Oil Products Co. Filed Aug. 31, 1938. No. 2,223,197.

Manufacture of mill greases—W. E. Bradley, assignor to Union Oil Co. (Cal.) Filed July 20, 1937. No. 2,222,589.

Mill grease—P. S. Clarke and W. E. Bradley, assignors to Union Oil Co. (Cal.) Filed July 20, 1937. No. 2,222,591.

Sulfurized oil—J. C. Zimmer, assignor to Standard Oil Development Co. Filed Oct. 8, 1937. No. 2,222,643.

Motor fuel—J. H. Boyd, Jr., assignor to Atlantic Refining Co. Filed Apr. 3, 1937. No. 2,222,649.

Lubricating oil—Matthew Fairlie, assignor to Sinclair Refining Co. Filed Oct. 21, 1938. No. 2,222,938.

Lubricating oil—A. C. Vobach, assignor to Sinclair Refining Co. Filed Oct. 21, 1938. No. 2,222,964.

Lubricants—C. F. Prutton, assignor to Lubri-Zol Development Corp. Filed Dec. 12, 1938, May 1, May 1, and May 8, 1940. Nos. 2,223,127-8-9-30.

Diesel fuel ignition accelerator—Pharis Miller and G. H. Cloud, assignors to Standard Oil Development Co. Filed May 4, 1939. No. 2,223,181.

Catalyst chamber and catalyst regeneration system—W. B. Plummer, assignor to Standard Oil Co. (Ind.) Filed Dec. 20, 1938. No. 2,223,268.

Lubricant composition and method of lubrication—T. G. Roehner and C. N. Rill, assignors to Socony-Vacuum Oil Co. Filed Dec. 11. 1937. No. 2,223,272.

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Production of liquid polymers—E. J. Houdry, assignor to Houdry Process Corp. Filed Nov. 23, 1936. No. 2,226,562.

Treatment of hydrocarbon oil—Basil Hopper, assignor to Union Oil Co. (Calif.) Filed Feb. 7, 1938. No. 2,227,089.

Process for manufacturing lubricating oils—D. B. Mapes and E. M. Dons, assignors to Mid-Continent Petroleum Corp. Filed Sept. 23, 1938. No. 2,227,377.

Kilns—J. W. Payne, assignor to Socony-Vacuum Oil Co. Filed Apr. 6, 1940, and June 14, 1939. Nos. 2,226,535 and 2,226,578.

Lubricating oil—H. V. Ashburn and R. E. Conary, assignors to Texas Co. Filed Mar. 16, 1939. No. 2,226,543.

Catalyst regeneration—R. E. Burk, assignor to Standard Oil Co. (Ohio) Filed Aug. 11, 1938. No. 2,226,548.

Gasoline antioxidant—J. W. Teter, assignor to Sinclair Refining Co. Filed July 14, 1937. No. 2,226,787.

Chemical Composition—Carleton Ellis, assignor to Standard Oil Development Co. Filed Feb. 6, 1940. No. 2,227,128.

Lubricating oil for diesel engines—E. V. Murphree, assignor to Standard Oil Development Co. Filed Dec. 23, 1937. No. 2,227,149.

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Oxidation of hydrocarbons to phenols—W. W. Moyer, and W. C. Klingehoefer, assignors to Solvay Process Co. Filed Oct. 4, 1937. No. 2,223,383.

Method of refining mineral oil—Boris Malishev, assignor one-third to Universal Development Corp., New York, and 3% to J. P. Nikonow. Filed Aug. 12, 1939. No. 2,223,524.

Fractionating tower—D. L. Dodds, Galveston, Tex. Filed Mar. 21, 1938. No. 2,223,556.

Process for removal of acid components from hydrocarbon distillates—D. L. Yabroff, and E. R. White, assignors to Shell Development Co. Filed Feb. 10, 1939. No. 2,223,798.

Alkylation of hydrocarbons—E. F. Pevere, L. A. Clarke, and G. B. Hatch, assignors to Texas Co. Filed May 6, 1939. No. 2,223,-938.

Method of dewaxing mineral oils—L. D. Jones, assignor to Sharples Corp. Filed Sept. 10, 1937. No. 2,223,939.

Cracking or pressure hydrogenation of hydrocarbons—Mathias Pier and Walter Simon, Germany, assignors to W. E. Currie, New York. Filed Mar. 24, 1939. No. 2,224,003.

Method for control of catalytic processes—G. S. Dunham, and Ernest Utterback, assignors to Socony-Vacuum Oil Co. Filed Oct. 18, 1938. No. 2,224,014.

Catalytic reaction of hydrocarbons—Albert Wassermann, London, England. Filed May 18, 1938. No. 2,224,071.

Reaction of hydrocarbons—M. M. Holm, E. H. Oakley, and R. L. Humphreys, assignors to Standard Oil Co. (Cal.) Filed June 26, 1939. No. 2,224,102.

Process for dewaxing petroleum oils—W. V. Stearns, Yeadon, Pa., assignor to Sun Oil Co. Filed July 2, 1938. No. 2,224,109.

Mineral oil composition—E. W. Fuller, and L. A. Hamilton, assignors to Socony-Vacuum Oil Co. Filed Sept. 28, 1940. No. 2,-223,411.

Lubricating composition—P. J. Gaylor, assignor to Standard Oil Development Co. Filed Oct. 16, 1937. No. 2,223,473.

Method of solid catalyst disposal—B. H. Shoemaker, assignor to Standard Oil Co. (Ind.) Filed Sept. 29, 1938. No. 2,223,643.

Lubricating oil—B. H. Lincoln, W. L. Steiner, and G. D. Byrkit, assignors to Lubri-Zol Development Corp. Filed Feb. 2, 1940. No. 2,223,766.

Asphalt preparation—A. P. Anderson, assignor to Shell Development Co. Filed Oct. 21, 1938. No. 2,223,776.

Metal catalyst and its preparation—Otto Beeck and F. F. Rust, assignors to Shell Development Co. Filed Aug. 16, 1938. No. 2,-223,777.

Lubricating composition—N. E. Peery, assignor to Shell Development Co. Filed Nov. 14, 1938. No. 2,223,793.

Lubricating oil—C. C. Towne, assignor to Texas Co. Filed Dec. 20, 1937. No. 2,223,932.

Lubricating oil and method of making—Sidney Musher, New York, assignor to Musher Foundation Inc. Filed Nov. 29, 1939. No. 2,223,941.

Improve Pharmacopoeia Tests For Petroleum Products

Revisions in tests for the U. S. Pharmacopoeia petroleum products, paraffin, petrolatum, white petrolatum, liquid petrolatum, and light liquid petrolatum, are under consideration for the 12th revision of the U. S. Pharmacopoeia which is expected to go to press sometime in 1941. A number of improvements in these tests have been proposed by V. F. Beyer, Stanco Inc., and are in the hands of Prof. E. Fullerton Cook, Philadelphia, who heads the revision committee. Several of the suggested changes were presented by Mr. Beyer at the pre-convention conference of the committee in Washington last May and additional recommendations were submitted by letter to the committee in October. Part of the latter supersedes the earlier recommendations.

While it is not known what proportion of the paraffin wax manufactured in the U. S. is used in pharmaceutical products, Mr. Beyer points out that a large proportion of the purchasers of fully refined paraffin wax include U.S.P. requirements as part of their specifications whether or not it is used in medicinal preparations. Also since the adoption of the new Food, Drug and Cosmetic Act, purchasers of petroleum products for use in cosmetic preparations and food containers such as cartons and paper milk bottles are demanding U.S.P. quality.

Mr. Beyer concludes that "it is, therefore, safe to assume that the use of U.S.P. tests for specification purposes is actually increasing and it is important to refiners to have reliable test methods. This was the first and most important consideration behind the proposals made. On the other hand, proposed changes in specifications merely liberalize the U.S.P. requirements to make acceptable a wider range of these products." It was felt that they in no way place a burden on the manufacturer and actually work to his advantage.

In his paper last May, Mr. Beyer pointed out that some of the official tests have been found inadequate for specification purposes. "Also some of the physical constants listed under tests for identity and purity are not sufficiently broad in scope to include all of the grades available and necessary for the full range of application.

"None of the proposed changes is concerned with what certain refiners can or cannot meet, or what can or cannot be produced from certain crudes. It is entirely a proposal for more precise definition of test procedures and making certain corrections in the physical constants by which these substances are identified. The recommendations covering the test or carbonizable substances in liquid petroleum are supported by the joint findings of a group representing pharmaceutical and petroleum companies." The co-operating companies are Atlantic Refining Co., L. Sonneborn Sons, Inc., Standard Oil Co. (Calif.), Standard Oil Co. (Ind.), Stanco Inc., Parke, Davis & Co., Eli Lilly & Co., E. R. Squibb & Sons, and United Drug Co.

Paraffin Tests

In the monograph on paraffin, it was recommended that the range of melting points be broadened from 50-57° C. to 47-65° C. (117-150° F.). The A.S.T.M. method of test for melting point of paraffin wax (D 87-37) was recommended for adoption as the official U.S.P. test. In the test for carbonizable substances, a number of changes were made which were incorporated in the following reworded procedure included in Beyer's letter to the committee in October.

"Place in a glass-stoppered test tube (Note 1, description and dimensions to be given under 'General Tests, Processes and Apparatus') which has been previously cleaned with sulfuric acid dichromate solution, rinsed with distilled water and dried, 3 cc. paraffin at a temperature just above the melting point and 3 cc. of sulfuric acid containing 94.5% to 94.9% H_2SO_4. Heat in a water bath at 70° C. for 10 minutes.

"After the test tube has been in the water bath for 5 min., remove it quickly, hold with a finger over the stopper and give 3 vigorous, vertical shakes over an amplitude of about 5 in. Shake quickly and at a rate corresponding to 5 shakes per second. Repeat every minute. Do not keep the test tube out of the bath longer than 3 seconds for each shaking period. At the end of 10 min. from the time it was first placed in the bath, remove the test tube.

"The acid does not become darker than the standard color produced by mixing in a similar glass-stoppered test-tube 3 cc. ferric chloride C.S., 1.5 cc. cobaltous chloride C.S. and 0.5 cc. cupric sulfate C.S., this mixed fluid being over-

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laid with 5 cc. liquid petrolatum. If the acid remains trapped in the paraffin, color of the resulting emulsion does not become darker than a similar emulsion produced by shaking the colorimetric standard solution with liquid petrolatum."

Note 1—Glass stoppered test tube for carbonizable substances in paraffin and liquid petrolatum.

"A test tube of heat-resistant glass fitted with a well-ground glass stopper, the stopper and the tube bearing identical and indestructible numbers. The tube shall be 140 ± 3 mm. in length and 14 ± 1 mm. in diameter and shall be calibrated at the 3-ml. and 10-ml. liquid levels. The capacity of the tube with stopper inserted shall be 16 ± 1.0 ml. A rolled edge may be provided for suspending the tube on the cover of the water bath."

One of the reasons for these changes is that "a great deal of trouble has been experienced in running this test due to the tendency of paraffin to form an emulsion with the acid when the 2 are heated and agitated. Mr. Beyer said a great many tests had been made to determine whether any change in the test procedure could be devised to eliminate the emulsion difficulty. While separation of the acid can be obtained quite satisfactorily by centrifuging immediately after the heating and shaking period, he was of the opinion that this would unduly complicate the test for pharmacopoeia purposes.

The simplest method found by Mr. Beyer was "to compare the resulting emulsified products with a mixture of equal portions of the colorimetric standard solution and liquid petrolatum, shaken vigorously in an identical test tube to give a similar emulsion. Of course, this mixture of color solution and liquid petrolatum will not remain emulsified for more than a few seconds after shaking but this is sufficient for the purpose and prolonged examination can be made by repeatedly shaking the comparison standard. The results check those obtained by examining the acid layer alone."

It was found also "that in no case does the wax become discolored without an accompanying serious discoloration of the acid. It is, therefore, suggested that since in many cases it is difficult to determine whether or not the wax is discolored, the wording of the test be changed to eliminate any reference to the color of the paraffin and the test result determined entirely on the color of the acid layer or the color of the emulsion."

Petrolatum and White Petrolatum

A broader range for petrolatum is also recommended. The proposed specific gravity range is 0.815 to 0.865 at 60° C. instead of 0.820 to 0.865 and the proposed melting point range is 38-60° C. instead of 38-54° F. Adoption of the A.S.T.M. method of test for melting point of petrolatum (D 127-30) as the official U.S.P. test was also proposed because of its wider use and application.

Liquid Petrolatum Tests

The changes in monograph covering liquid petrolatum involve the viscosity conversion table, use of the term "opalescent" in the test for solid paraffins, and the test for carbonizable substances. Use of the A.S.T.M. viscosity conversion table for Saybolt Universal and Kinematic viscosity (D 446-39) was recommended to replace the present table. These conversions make a difference of about 2 seconds Saybolt in the minimum viscosity for liquid petrolatum and the maximum viscosity for light liquid petroleum.

To substitute for the term "opalescent," it is proposed that the definition read, "Newsprint viewed through the diameter of the test tube containing liquid petrolatum should be readable."

The test for carbonizable substances, along with the above two changes, was made last May, and the similar test, as given above to apply to paraffin, was modeled after this proposed test, as applied to liquid petrolatum:

"Place in a glass-stoppered test tube, which has been previously rinsed with sulfuric acid dichromate solution, rinsed with distilled water and dried, 5 cc. of liquid petrolatum and 5 cc. of sulfuric acid containing from 94.5 to 94.9% of H_2SO_4. Heat in a bath of boiling water during 10 minutes. After the test tube has been in the water bath for 30 seconds, remove it quickly, hold with a finger over the stopper and give 3 vigorous, vertical shakes over an amplitude of about 5 in. Shake quickly and at a rate corresponding to 5 shakes per second. Repeat every 30 seconds. Do not keep the test tube out of the bath longer than 3 seconds for each shaking period. At the end of 10 minutes from the time it was first placed in the bath, remove the test tube: the liquid petrolatum remains unchanged in color and the acid does not become darker than the standard color produced by mixing in a similar test tube 3 cc. of ferric chloride C.S., 1.5 cc. of cobaltous chloride C.S., and 0.5 cc. of cupric sulfate C.S., this mixed fluid being overlaid with 5 cc. of liquid petrolatum (carbonizable substances)."

This varies from the present text in four particulars: (1) substitution of "test tube" for "cylinder," (2) cleaning and drying the test tube before use instead of merely rinsing with sulfuric acid, (3) narrowing the strength of the test acid, and (4) specifying the precise manner of shaking. The method of cleaning is considered an important factor in obtaining reproducible results since the rinse acid clinging to the inside surfaces of the test tube will readily pick up moisture from the air and thus dilute the test acid sufficiently to affect the result. The necessity for narrowing the limits of the acid concentration has been proved by data presented in a summary of experiments conducted by the co-operating laboratories of the pharmaceutical and petroleum companies.

Temperature Measurement

Fundamental knowledge in the field of temperature and its measurement is covered exhaustively in a new volume on Temperature, Its Measurement and Control in Science and Industry. The book is a collection of 125 papers by eminent engineers, metallurgists, physicists, physicians, and biologists. These papers were presented at a symposium Nov. 2-4, 1939, under the auspices of the American Institute of Physics, National Bureau of Standards, National Research Council and 12 scientific and technical societies.

The scope of the volume is described as all-inclusive, ranging from the closest possible approach to absolute zero to the temperature of the stars. One chapter is devoted to Oil Industries and includes 11 papers by oil technologists of which 6 are related to some phase of production and prospecting. Louis deFlorez has written on "Some Practical Consideration on Temperature Control," and E. W. Thiele and W. B. Kay, Standard Oil Co. of Indiana, on "The Significance of the Critical Temperature of Mixtures."

"Measurement of Metal Temperatures of Cracking Still Tubes" is described by O. G. Kaasa, Sinclair Refining Co., and "A Theoretical Study of the Design of Thermocouples for Experimental Cracking Units" has been prepared by E. R. Brownscombe, The Atlantic Refining Co. D. E. Larson, Chicago Bridge and Iron Co., contributed the material on "Temperature Control Reduces Oil Storage Losses."

Twelve other chapters deal with temperature and temperature scales, precision thermometry, education, natural sciences, biology, temperature regulation in man, automatic temperature control, special applications and methods, general engineering, metals and ceramic industries, optical and radiation pyrometry, and thermometric metals and alloys.

The book contains 1300 pages and 550 illustrations and is available until Feb. 1, 1941, at $9 in the Book Department of National Petroleum News. List price after that date will be $11.

Joseph W. Lewis, Jr., Chicago, who left the Atlantic Refining Co. in 1935 to take a fling at radio (Mutual network's "Mystery History") and the theatre, is now back in "oil" doing sales promotion work for Alcorn Combustion Co.'s TVP cracking process.